

April, 1952

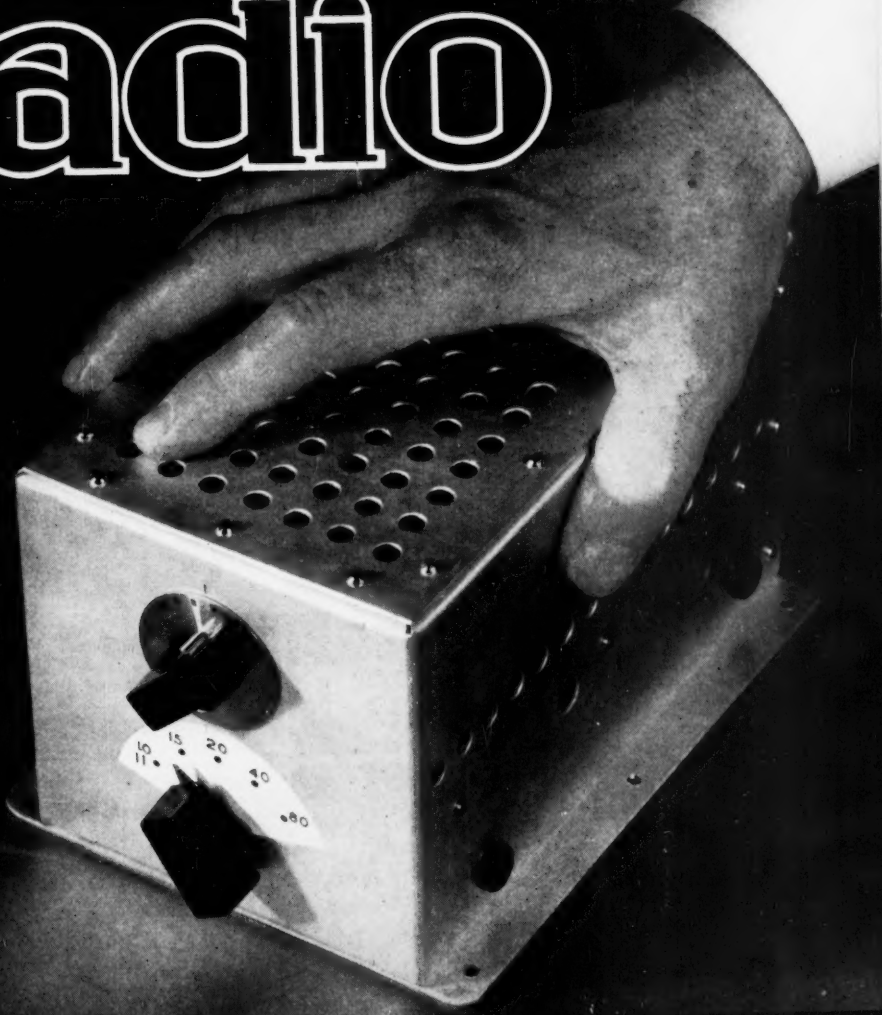
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QST

devoted entirely to

amateur radio



Special—The "QST" — A COMPACT SIX-BAND FREQUENCY MULTIPLIER

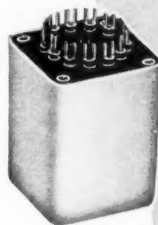
ULTRA COMPACT UNITS...OUNCER UNITS

HIGH FIDELITY.... SMALL SIZE FROM STOCK

UTC Ultra compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. High fidelity is obtainable in all individual units, the frequency response being ± 2 DB from 30 to 20,000 cycles.

True hum balancing coil structure combined with a high conductivity die cast outer case, effects good inductive shielding.

Type No.	Application	Primary Impedance	Secondary Impedance	List Price	
A-10	Low impedance mike, pickup, or multiple line to grid	50, 125/150, 200/250, 333, 500/600 ohms	50 ohms	\$16.00	
A-11	Low impedance mike, pickup, or line to 1 or 2 grids (multiple alloy shields for low hum pickup)	50, 200, 500	50,000 ohms	18.00	
A-12	Low impedance mike, pickup, or multiple line to grids	50, 125/150, 200/250, 333, 500/600 ohms	80,000 ohms overall, in two sections	16.00	
A-14	Dynamic microphone to one or two grids	30 ohms	50,000 ohms overall, in two sections	17.00	
A-20	Mixing, mike, pickup, or multiple line to line	50, 125/150, 200/250, 333, 500/600 ohms	50, 125/150, 200/250, 333, 500/600 ohms	16.00	
A-21	Mixing, low impedance mike, pickup, or line to line (multiple alloy shields for low hum pickup)	50, 200/250, 500/600	50, 200/250, 500/600	18.00	
A-16	Single plate to single grid	15,000 ohms	60,000 ohms, 2:1 ratio	15.00	
A-17	Single plate to single grid & MA unbalanced D.C.	As above	As above	17.00	
A-18	Single plate to two grids, Split primary	15,000 ohms	80,000 ohms overall, 2:3:1 turn ratio	16.00	
A-19	Single plate to two grids & MA unbalanced D.C.	15,000 ohms	80,000 ohms overall, 2:3:1 turn ratio	19.00	
A-24	Single plate to multiple line	15,000 ohms	50, 125/150, 200/250, 333, 500/600 ohms	16.00	
A-25	Single plate to multiple line & MA unbalanced D.C.	15,000 ohms	50, 125/150, 200/250, 333, 500/600 ohms	17.00	
A-26	Push pull low level plates to multiple line	30,000 ohms plate to plate	50, 125/150, 200/250, 333, 500/600 ohms	16.00	
A-27	Crystal microphone to multiple line	100,000 ohms	50, 125/150, 200/250, 333, 500/600 ohms	16.00	
A-30	Audio choke 250 henrys	5 MA 6000 ohms D.C.	65 henrys	10 MA 1500 ohms D.C.	12.00
A-32	Filter choke 60 henrys	15 MA 2000 ohms D.C.	15 henrys	30 MA 500 ohms D.C.	10.00



TYPE A CASE
1 1/2" x 1 1/2" x 2" high

UTC OUNCER components represent the acme in compact quality transformers. These units, which weigh one ounce, are fully impregnated and sealed in a drawn aluminum housing 7/8" diameter...mounting opposite terminal board. High fidelity characteristics are provided, uniform from 40 to 15,000 cycles, except for O-14, O-15, and units carrying DC which are intended for voice frequencies from 150 to 4,000 cycles. Maximum level 0 DB.



OUNCER CASE

7/8" Dia. x 1 1/4" high

Type No.	Application	Pri. Imp.	Sec. Imp.	List Price
O-1	Mike, pickup or line to 1 grid	50, 200/250 500/600	50,000	\$14.00
O-2	Mike, pickup or line to 2 grids	50, 200/250 500/600	50,000	14.00
O-3	Dynamic mike to 1 grid	7.5/30	50,000	13.00
O-4	Single plate to 1 grid	15,000	60,000	11.00
O-5	Plate to grid, D.C. in Pri.	15,000	60,000	11.00
O-6	Single plate to 2 grids	15,000	95,000	13.00
O-7	Plate to 2 grids, D.C. in Pri.	15,000	95,000	13.00
O-8	Single plate to line	15,000	50, 200/250, 500/600	14.00
O-9	Plate to line, D.C. in Pri.	15,000	50, 200/250, 500/600	14.00
O-10	Push pull plates to line	30,000 ohms plate to plate	50, 200/250, 500/600	14.00
O-11	Crystal mike to line	50,000	50, 200/250, 500/600	14.00
O-12	Mixing and matching	50, 200/250	50, 200/250, 500/600	13.00
O-13	Reactor, 300 Hys. - no D.C.; 50 Hys. - 3 MA. D.C.		6000 ohms	10.00
O-14	50:1 mike or line to grid	200	1/2 megohm	14.00
O-15	10:1 single plate to grid	15,000	1 megohm	14.00

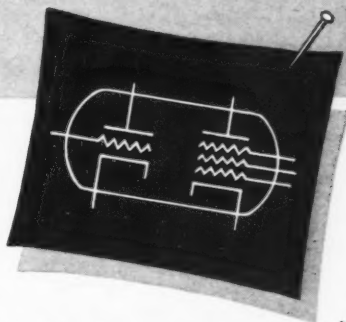
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purchase money
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leads between sockets



6U8
V-h-f 9-pin
miniature



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Useful in transmitters. You can put the triode section of the 6U8 to work as an oscillator, and make the pentode half a doubler or amplifier—for each tube section is electrically independent . . . Frequency? High enough for the 2-meter band and above.

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PUBLISHED, MONTHLY, AS ITS OFFICIAL ORGAN, BY THE AMERICAN RADIO RELAY LEAGUE, INC., AT WEST HARTFORD, CONN., U. S. A.; OFFICIAL ORGAN OF THE INTERNATIONAL AMATEUR RADIO UNION

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Subscription rate in United States and Possessions, \$4.00 per year, (postpaid); \$4.25 in the Dominion of Canada, \$5.00 in all other countries. Single copies, 40 cents. Foreign remittances should be by international postal or express money order or bank draft negotiable in the U. S. and for an equivalent amount in U. S. funds.

Entered as second-class matter May 29, 1919, at the post office at Hartford, Connecticut, under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1102, Act of October 3, 1917, authorized September 9, 1922. Additional entry at Concord, N. H., authorized February 21, 1929, under the Act of February 28, 1925.

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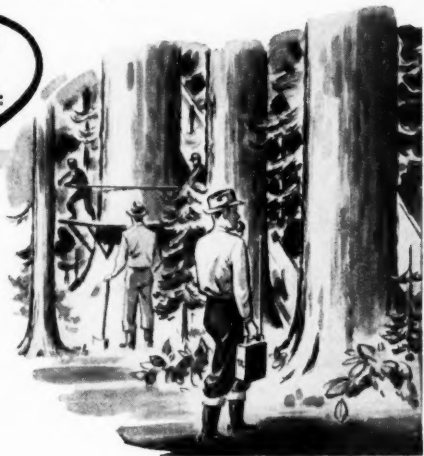
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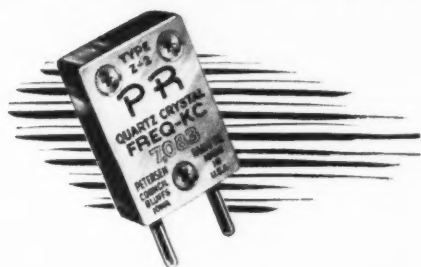
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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (or preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio Club reports are also desired by SCMs for inclusion in OST. **All ARRL Field Organization appointments** are now available to League members. These include ORS, OPS, OPS-00 and OBS. Also, where vacancies exist SCMs desire applications for SEC, EC, RM, and PAM. In addition to station and leadership appointments for Members, *all amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisites, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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243 Colon Ave., San Francisco 12, Calif.

Roanoke Division

WILLIAM H. JACOBS, W4CVQ
Route 6, Raleigh, N. C.
Vice-Director: Gus M. Browning, W4BPD
135 Broughton St., S. E., Orangeburg, S. C.

Rocky Mountain Division

FRANKLIN K. MATEKA, W0DD
P. O. Box 212, Estes Park, Colo.
Vice-Director: Ramon S. Walker, W0OWP
P. O. Box X, Brush, Colo.

Southeastern Division

LAMAR HILL, W4BOL
104 Myrtle, Cuthran, Ga.
Vice-Director: Ernest W. Barr, W4GOR
911 Rosemary Ave., SW, Atlanta, Ga.

Southwestern Division

JOHN R. GRIGGS, W6KW
10412 Don Pico Rd., RFD 2, Spring Valley, Calif.
Vice-Director: Walter R. Joos, W6EKM
1315 N. Overhill Drive, Inglewood 3, Calif.

West Gulf Division

A. DAVID MIDDLETON, W5CA
9 Kay Road, Tlajeras, N. M.
Vice-Director: Frank E. Fisher, W5AHT/AST
104 E. 11th, Fawhuska, Okla.



"It Seems to Us..."

THE BOARD MEETING

Last autumn — or in some divisions a year earlier — you selected a fellow-amateur to serve as your director and represent Full Members in your area in the government of the affairs of the League. We are now rapidly approaching the second major step in the system provided for democratic control of ARRL — the yearly meeting of the 16 elected representatives of amateur radio to discuss League and general amateur affairs, to consider problems and proposals, and to make decisions on them in accord with the majority sentiment.

Currently the directors are engaged in visiting clubs and attending hamfests, and many of them are using the mail to solicit expressions of opinion on one live subject or another. In this general manner the director becomes informed on the needs and desires of the members in his division, and is thereby enabled to reflect properly the net sentiment of his division in discussions which will occur at the Board table in May. So the grass roots in this system is *you*. And now is the prime opportunity for you or your club to express views to your director on matters of the day, or on a new pet idea or proposal of your own. His address is on page 8 of this issue of *QST*. He would like to hear from you.

NOVICE CHARACTERISTICS

At Hq. we make a special effort, through periodic spot surveys, to keep tabs on characteristics and trends in amateur radio. We gather all sorts of interesting and useful bits of information. A postwar check showed the average age of hams to be about 34 years; 71 per cent of all amateurs are married; the typical ham has been licensed for 12 years, a member of the League for 8; more than half of all amateurs either have completed a four-year college course or are in school aiming at that end; "Hints & Kinks" is about the most popular feature in *QST*; hams prefer rack-and-panel transmitter construction two-to-one over table (cabinet) rigs; and so on.

We keep a particular eye on the newcomer. We know that, in pre-Novice days, the average age of the new licensees was 27.8; that most of

them became interested in hamming through an amateur friend; that practically every one used our *License Manual* and about one-third took advantage of WIAW transmissions for code practice; that one-third (not the same third, we hope!) flunked the exam on an earlier try; that *QST* is read by 85 per cent of the newcomer group. And so on.

As you might expect, we were keenly interested in seeing how the Novices would shape up, and when we put a finger on the pulse of the first WNs to be licensed last year, the result most striking to us is the similarity between Novices and earlier newcomers via the regular channels. The average age of the Novice is 25.7 years; actual ages ranged from 8½ to 86! Like their earlier counterparts, the Novices mostly became interested in hamming through an amateur friend, practically all used our *LM* for examination study, and many used WIAW for code practice. Half the Novices required three months or less to prepare for their exam; the same time was needed for earlier newcomers to study for old Class B or C. Experimenting and ragchewing turn out to be the prime interests of both groups, although among Novices "DX" runs a strong third. As to power inputs, Novices break down almost equally between under 25 watts, 25-50 watts, and 50-75 watts; with no similar maximum for the other group of course no direct comparison is possible, but we note the majority of newcomers started with 75 watts or less anyway. And so far as equipment is concerned, the Novice is no different from his earlier counterpart or from any of the rest of us for that matter — he, too, in the ratio of nine-to-one finds a manufactured receiver more to his liking and convenience than building one of his own. At the time of survey, about three months after license issuance, half the Novices already could handle 13 w.p.m. or more; in fact, one-fourth of them had already qualified for a General or Conditional Class license, while most of the remainder were going up for the exam shortly.

What gives us the warmest feeling, though, is that our survey indicates that *QST* is read by 93 per cent of the new WNs. That's starting right, OMs!

Strays

WARAZ uses a new plastic liquid product, Krylon, to coat QSLs, certificates and the like with a preserving and washable finish. It is available clear or in a variety of tints.

At a recently conducted amateur examination held by FCC at the Ohio State School for the Blind, Columbus, Ohio, seven lads qualified for their Novice Class licenses.

Engineer R. J. Cotton of the Commission's Detroit office permitted code tests to be written in Braille; the copy was translated to him by a school instructor. Theoretical examinations were given individually by Mr. Cotton who received question answers in oral form.

Such special consideration has been FCC's policy for years with regard to blind, paralyzed or deaf amateur operator candidates. The Commission fully recognizes the benefit possession of an amateur license can be to the handicapped person and particularly to the shut-in.

Some of the old-timers are having a difficult time substantiating the fact that they held amateur licenses during or prior to April, 1917. The National Amateur Wireless Association used to publish bulletins which listed amateur licensees; the possession of some of these bulletins would help either ARRL or FCC give some of the Extra Class licensee applicants a hand. There may be other lists which would help these fellows out. We are particularly interested in information covering the period 1915-1917. Can anyone give us an assist?



No, you're not seeing double, you're seeing triple! Richard, Charles and Robert Fenwick, of Kentland, Indiana, who bear the calls W9PKS, W9PKU and W9NJS respectively, are probably the only identical triplets in the amateur ranks. Licensed last year, the boys are 15 and sophomores at Kentland High. The Fenwicks like contest work in the c.w. bands and also enjoy 2-meter operation.

HAMFEST CALENDAR

ILLINOIS — Friday through Sunday, May 23rd-25th, at the Hotel President, 2045 North Lincoln Ave., Chicago — a get-together of W9 YLs. The registration fee is \$1.00, in advance. For details of the program and arrangements, write to W9GME at the Hotel President address.

MASSACHUSETTS — Saturday, April 19th, at the Lafayette House, 20 miles south of Boston on U. S. Route No. 1 — a get-together of W1 YLs. For tickets to this luncheon and rag-chewing session, send \$2.00 in advance to W1BCU, 343 Fisher Street, Walpole, Mass.

CALIFORNIA — Saturday, May 3rd, at the Fresno Memorial Auditorium — the 10th Annual Hamfest of the Fresno Amateur Radio Club. Dinner, entertainment, activities, and prizes. Preregistration tickets may be purchased from Grant Storey, 908 W. Pico, Fresno, Calif., at \$4.00 each.

TEXAS — Sunday, April 20th, at East Texas State College — a hamfest sponsored jointly by the Bonham, Paris, Sulphur Springs and Texhoma Clubs of Northeast Texas, and the East Texas Amateur Radio Club. The usual "grab-bag" drawing will be held. For further details, write to W5AJ, Route 1, Box 201-B, Pittsburg, Texas.

NEW YORK — Saturday, May 10th, at the Elk's Club, Rochester — the Annual Hamfest of the Rochester Amateur Radio Association. Technical talks are scheduled for the afternoon, with separate entertainment for the ladies. Dinner in the evening will be followed by entertainment and a speaker. For reservations, write P. O. Box 1388, Rochester 3, N. Y.

NEW JERSEY — Saturday evening, April 19th, in the Terrace Room, Hotel Stacy-Trent — 8th Annual Old Timers' Nite Round-up and Banquet of the Delaware Valley Radio Assn. Turkey dinner will be served promptly at 6:30 p.m. Program includes talks by well-known radio personalities. Bring your oldest commercial or amateur tickets as awards will be made to those with the earliest dates, including a special award to the "Grand OM" in attendance. W2ZI's collection of old-time gear will be on display. Reservations may be obtained before April 15th from General Chairman Ed G. Raser, 315 Beechwood Ave., Trenton 8, N. J., at \$5.00 per person. Tickets purchased at the door will be \$6.00. Plan to bring as many guests as you wish; clubs and groups should request special seating arrangements well in advance. As in the past, the party will be stag.

PENNSYLVANIA — Sunday, April 20th, at the Lodge in North Park — annual hamfest of the Western Pennsylvania Emergency Network. This is a picnic-gathering, and there will be numerous competitive events. For further details, write to W3OBO, 1400 Creedmoor Ave., Pittsburgh 26, Penna.

OREGON — Saturday and Sunday, April 26th and 27th, at Eugene, Oregon — the Oregon Amateur Radio Convention, sponsored by the Valley Radio Club. Speakers will include ARRL Division Director Rex Roberts, and John Reinartz on screen-grid modulation. There will be model control demonstrations by W7HLB and W7LVN. Admission will be \$6.50 for hams and \$2.50 for XYLs and friends. For further information, write to W7FBA, 400 Howard Ave., Eugene, Ore.

WISCONSIN — Saturday, April 26th, at the Youth Building, Wausau — Annual Hamfest and Banquet of the Wisconsin Valley Radio Association. Starting at 6 p.m., a well-rounded program has been arranged, featuring an excellent banquet, entertainment, and hamfesting galore. Scheduled for the afternoon is a Wisconsin Section meeting at 3 p.m. followed by an organizational meeting of the Wisconsin Council of Radio Clubs. Please make reservations in advance to assist with meal plans. Tickets, \$3.00, available from Lawrence Lapinske, W9EWM, P. O. Box 179, Wausau, Wis.

COMING A.R.R.L. CONVENTIONS

June 14th — New England Division, Springfield, Mass.

June 28th-29th — West Gulf Division, Corpus Christi, Texas

The "Bandbox"—A Single-Control Frequency-Multiplier Unit

Compact Transmitter Subassembly for Six Bands

BY DONALD H. MIX,* WITS

• The Bandbox is a four-stage frequency multiplier covering six ham bands, brought down to the size and convenience of a single stage. It is designed to work between a low-power VFO or crystal oscillator and an amplifier using an 807 or similar type. Changing bands is merely a matter of flipping the switch to the desired band and resonating at the desired frequency with the single control. It is a simple matter to transfer this component-size unit from one chassis to another when making alterations. The Bandbox should fit readily into any program of building or rebuilding a multiband rig.

FOR years it has been a not uncommon practice in constructing a multiband transmitter to lay all of the tubes and other components out on a chassis and then try to devise a means of switching or changing coils to give output on the desired bands as conveniently as possible. More often than not, this procedure leads to bulky and awkward mechanical arrangements, and a multiplicity of controls. When rebuilding becomes desirable, everything must be done over again. This includes the most time-consuming and complicated part of the job—the dismantling and reassembly of the frequency-multiplier stages which might have been doing an entirely satisfactory job in the old rig. The primary function of a frequency multiplier is to multiply frequency and, once a good design has been found, it should serve this purpose in one transmitter as well as in another. Following out this line of reasoning led eventually to the multiplier unit shown in the photographs.

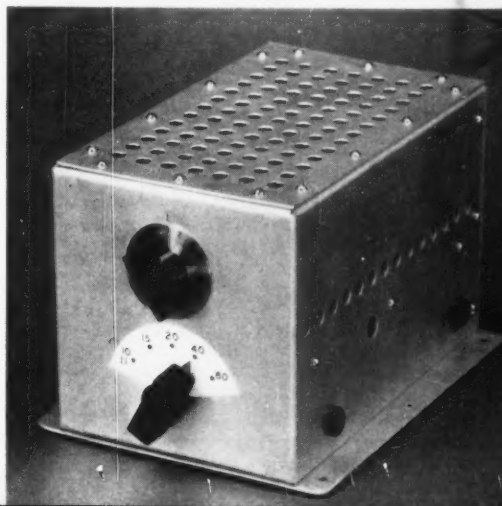
The unit is a subassembly package containing all tubes and circuits necessary for multiplying frequency from any low-power 1.75- or 3.5-Mc. VFO or crystal oscillator. It gives enough output

on any of the six ham bands from 3.5 to 28 Mc. (including the 21- and 27-Mc. bands) to drive any amplifier tube such as the 2E26, 807 or the new 6146. Thus a multiband rig could consist of an oscillator of the desired type, this multiplier unit and one of the above amplifiers. For higher power up to a full kilowatt, only a second beam tetrode stage would have to be added. The unit is of sufficiently small dimensions and so designed that it can be mounted on a chassis almost as easily as a tank condenser or other similar single component might be. It can be transferred from one chassis to another simply by removing a half-dozen mounting screws and unplugging the external connections. Furthermore, the four stages are shielded as a unit and the TVI filtering job, once done, doesn't have to be repeated for the next project. There is only one tuning control for all bands. Changing from one band to another is simply a matter of clicking a switch and resonating with the single control for maximum grid current to a following amplifier. In operation, no further metering is necessary. An inexpensive 70-ma. unit will easily take care of the power-supply requirements.

The desirability of multiplying frequency at low power level has already been often stressed as an aid in reducing TVI, but there are other advantages as well. Since the practically-obtainable efficiency of frequency multipliers is quite low, the over-all transmitter efficiency is improved by multiplying frequency in the low-power stages where the watts lost will be less. The necessary step-up in power can be obtained in a straight amplifier operating at much higher efficiency. Furthermore, inexpensive low-voltage components can be used and this saving can be appreciable in a rig of several

* Assistant Technical Editor, QST.

This small package contains the necessary frequency multipliers to give output on any of the six ham bands from 80 to 10 from any 1.75- or 3.5-Mc. VFO or crystal oscillator. The switch knob at the bottom selects the band, while the single tuning control resonates all circuits. Oscillator input is connected to the pin jack in front; output on the desired band is taken from the one to the rear. The large hole below the row of ventilating holes in the side is for adjusting the 14-Mc. grid trimmer. A similar hole in the opposite side provides access to the 10-meter grid trimmer.



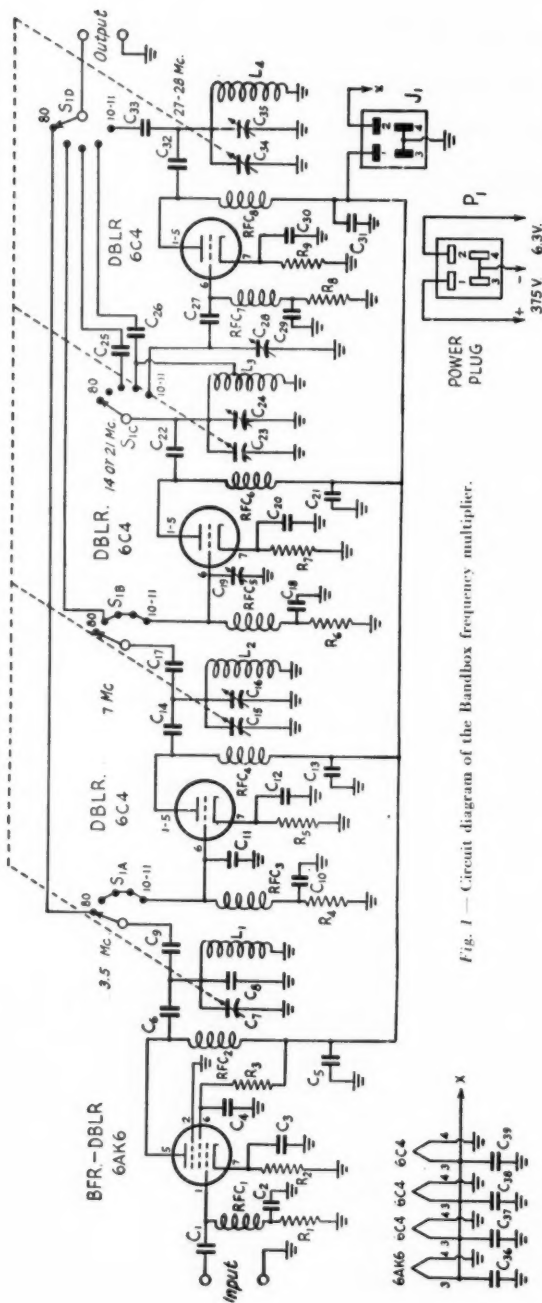


Fig. 1—Circuit diagram of the Bandbox frequency multiplier.

C₁—170- μ fd mica.

C₂, C₃, C₄, C₅, C₆, C₇, C₈, C₉, C₁₀, C₁₁, C₁₂, C₁₃, C₁₄, C₁₅, C₁₆, C₁₇, C₁₈, C₁₉, C₂₀, C₂₁, C₂₂, C₂₃, C₂₄, C₂₅, C₂₆, C₂₇, C₂₈, C₂₉, C₃₀, C₃₁, C₃₂, C₃₃, C₃₄, C₃₅, C₃₆, C₃₇, C₃₈, C₃₉—0.001- μ fd, disc, silvered mica.

C₇—Approx. 65- μ fd, variable (see text and accompanying footnote).

C₈—100- μ fd, silvered mica.

C₉—220- μ fd, silvered mica.

C₁₀—47- μ fd, silvered mica.

C₁₁—Approx. 35- μ fd, variable (see text and accompanying footnote).

C₁₂—150- μ fd, mica trimmer or 30- μ fd, mica trimmer.

C₁₃—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₁₄—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₁₅—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₁₆—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₁₇—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₁₈—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₁₉—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₂₀—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₂₁—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₂₂—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₂₃, C₂₄, C₂₅, C₂₆—100- μ fd, mica.

C₂₇, C₂₈—Approx. 25- μ fd, variable (see text and footnote).

C₂₉—47- μ fd, mica.

C₃₀—3300 ohms, 1 watt.

C₃₁—3300 ohms, 1 watt.

C₃₂—2200 ohms, 1 watt.

C₃₃—2350 ohms, 2 watts (two 4700-ohm 1-watt in parallel).

C₃₄—1940 ohms, 2 watts (3300-ohm 1-watt and 4700-ohm 1-watt in parallel).

C₃₅—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₃₆—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₃₇—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₃₈—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₃₉—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₄₀—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₄₁—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₄₂—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₄₃—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

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C₅₆—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₅₇—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₅₈—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₅₉—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

C₆₀—Approx. 12 μ h, 24 turns No. 22 d.c.c., 1-inch diam., close-wound, or smaller wire spaced to length of $\frac{3}{4}$ inch (see text).

L₁—Approx. 1.2 μ h, 17 turns, $\frac{3}{4}$ -inch diam., 17/32 inch long (B & W 3012 Miniature).

L₂—Approx. 1.8 μ h, 17 turns, $\frac{3}{4}$ -inch diam., $\frac{3}{4}$ inch long, tapped at 60% from ground end; see text (B & W 3011 Miniature).

L₃—Approx. 0.4 μ h, 7 turns, $\frac{3}{4}$ -inch diam., $\frac{3}{4}$ inch long (B & W 3003 Miniature).

L₄—Four-contact female cable connector (Jones S-301-CCD).

P₁—Four-contact male power connector (Jones P-301-CCD).

R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, R₉, R₁₀—R₁—4-pole 6-contact rotary switch (see text for assembly procedure).

R₂—R₂—4-pole 6-contact rotary switch (see text for assembly procedure).

R₃—R₃—4-pole 6-contact rotary switch (see text for assembly procedure).

R₄—R₄—4-pole 6-contact rotary switch (see text for assembly procedure).

R₅—R₅—4-pole 6-contact rotary switch (see text for assembly procedure).

R₆—R₆—4-pole 6-contact rotary switch (see text for assembly procedure).

R₇—R₇—4-pole 6-contact rotary switch (see text for assembly procedure).

R₈—R₈—4-pole 6-contact rotary switch (see text for assembly procedure).

R₉—R₉—4-pole 6-contact rotary switch (see text for assembly procedure).

R₁₀—R₁₀—4-pole 6-contact rotary switch (see text for assembly procedure).

S₁—4-pole 6-contact rotary switch (see text for assembly procedure).

S₂—4-pole 6-contact rotary switch (see text for assembly procedure).

S₃—4-pole 6-contact rotary switch (see text for assembly procedure).

S₄—4-pole 6-contact rotary switch (see text for assembly procedure).

S₅—4-pole 6-contact rotary switch (see text for assembly procedure).

S₆—4-pole 6-contact rotary switch (see text for assembly procedure).

stages. Added to this is the advantage of compactness.

The Circuit

The circuit diagram is shown in Fig. 1. The first stage, operating at 80 meters, uses a well-screened tube, the 6AK6, because it is called upon to work as a straight amplifier when the oscillator output is in the same band. Type 6C4 triodes are used in the remaining stages not only to simplify the circuit and wiring but also because they are much more tolerant in regard to driving voltage. It is not necessary to adjust the excitation carefully in each stage to prevent overdriving in the next.

The tuning condensers of all stages are ganged to a single control. Broadband circuits were considered but finally discarded because the relatively low efficiency would make larger tubes with higher dissipation rating almost a certain requirement. The 80-meter circuit is designed to cover only the required tuning range for that band—3500 to 4000 kc. C_3 is a bandspread padder. However, when the bandswitch is turned to the 7-Mc. and higher-frequency positions, C_{11} adds enough capacitance across the 80-meter tank circuit to shift its lowest frequency to about 3350 kc. so that the harmonics will include the 11-meter band. This is permissible, of course, since the frequencies at the high end of the 80-meter band are not needed for multiplying to the other bands. It is to this second range that the following stages are tracked. The 21-Mc. band is reached by tripling frequency in the stage otherwise used for 14 Mc. The tuning range here is automatically shifted by the bandswitch which shorts out an appropriate portion of L_3 for 21 Mc.

The trimmers, C_{19} and C_{23} , are to compensate for the difference between the input capacitance of the 6C4s and the larger capacitance of the screen-grid tube to be used in the amplifier, thereby automatically maintaining proper conditions for tracking. C_{16} , C_{24} and C_{35} adjust the range over which the tuning condensers will tune.

Parallel plate and grid feed is used throughout so that the tuning condensers need not be insulated from the chassis. All tubes are protected against excessive dissipation, when not being driven, by the use of cathode biasing resistors. To keep the circuit as simple as possible, capacitive coupling is used between all stages and the unit is designed for capacitive coupling also at the input and output.

Construction

If dimensions are to be kept to a minimum, it will be necessary to make a special shielding enclosure of sheet aluminum. However, if size is not considered an important factor, a standard $5 \times 6 \times 9$ -inch box can be used. If this is done, it would be advisable to keep the length of the chassis about the same as described here. Otherwise, it may be difficult, if not impossible, to get the unit, with its shafts projecting, into the box. The width of the chassis should be made

5 inches to match the width of the standard box, but the components should not be spread out accordingly. It might be possible to make use of a standard $1\frac{1}{2} \times 4\frac{1}{2} \times 8$ -inch chassis, fastening it flush against the front of the box and using spacers to anchor it to the rear, but the lips on the standard chassis will make it more difficult to do the necessary work underneath.

The chassis shown is made from sheet aluminum about $\frac{3}{16}$ inch thick. It is $4\frac{1}{2}$ inches wide and $7\frac{1}{2}$ inches long, with $\frac{1}{2}$ -inch lips bent down along the longer edges for fastening to the sides of the box. The box is made to fit the chassis as closely as possible and has an inside height of $4\frac{1}{2}$ inches. The front and the two sides are made from a single piece, with $\frac{1}{2}$ -inch lips bent along both top and bottom edges. Similar lips are bent along all four edges of the removable back. The two rear corners of the chassis must be notched out for these lips.

The chassis is placed in the box with its top surface $2\frac{1}{4}$ inches down from the top of the box and a row of $\frac{1}{4}$ -inch holes is drilled along each side of the box, just above the chassis level. The top cover also is perforated. The box and chassis are assembled with No. 4 machine screws tapped into the aluminum, although self-tapping screws can be substituted. The bottom plate is made 1 inch wider than the box to provide a $\frac{1}{2}$ -inch flange along each side for fastening down to a chassis. To provide clearance for the heads of the screws holding the bottom plate, a pair of aluminum-sheet spacing strips, about $\frac{3}{4}$ inch wide and the length of the box, can be placed under the flanges.

The input and output terminals are 'phone-tip jacks centered $\frac{3}{4}$ inch up from the bottom on the right-hand side of the box. The output terminal is about 1 inch from the rear and the input jack $1\frac{3}{4}$ inches from the front. At the rear, the power connector is centered $\frac{3}{4}$ inch from the left edge and $1\frac{1}{2}$ inches up from the bottom.

The bandswitch is made up from Centralab Switchkit parts. The index assembly is Type P-123 and the ceramic wafers are Type X having 6 positions, 5 of which are used. The switch is mounted on aluminum brackets (with the tie rods in a vertical plane) to bring the center of the shaft $1\frac{1}{8}$ inches below the chassis. In the bottom-view photograph, the first wafer at the top (80) is spaced $\frac{1}{2}$ inch from the index head, with its point contacts to the left. The second wafer (40) is spaced 1 inch from the first with its point contacts to the right. The third wafer (20 and 15) is spaced 2 inches from the second with its point contacts to the left. The last wafer (output) is spaced 1 inch from the preceding one with its point contacts also to the left. The rear mounting bracket is spaced $\frac{1}{4}$ inch behind the last wafer. The front mounting bracket is fastened to the index head at the shaft bushing.

The tube sockets are placed $\frac{3}{4}$ inch in from the edges of the chassis. The 6AK6 and the 14-Mc. 6C4 are to the right, spaced $1\frac{1}{4}$ and $4\frac{3}{4}$ inches respectively back from the front edge of the chassis. The 7-Mc. and 28-Mc. tubes are to

the left, spaced back $2\frac{5}{8}$ and $6\frac{1}{4}$ inches respectively.

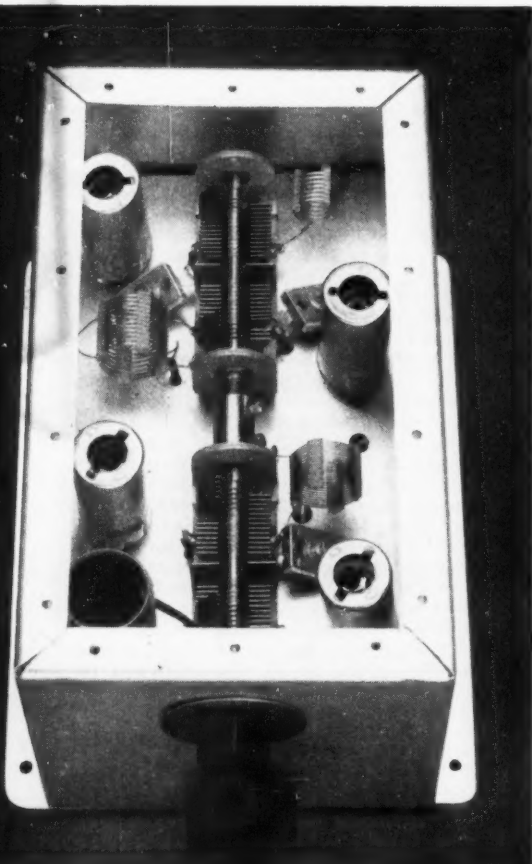
The shafts of the two tuning-condenser units¹ are coupled together with a Millen type 39003 rigid coupling. It may be necessary to file down the front end of the coupling close to the setscrew hole to permit the setscrew to get a good grip on the short tail shaft of the front condenser. In the first condenser section at the front (80), the last 5 rotor plates are removed. In the second section (40), the first 9 rotor plates are removed. In the third section (20 and 15), the first 4 rotor plates are left in and the remainder are removed. The fourth stator plate of this section also is removed, but the rest of the stators are left in. In the last section, all rotors except the last four are removed.

The condenser gang is mounted on top of the chassis with its front mounting hole $\frac{1}{2}$ inch from the front edge of the chassis. In assembling the

unit, the condenser gang should be mounted first with screws at the two inner mounting holes only. Then the switch gang underneath should be positioned and the mounting holes in the brackets drilled to match the front and rear mounting holes of the condenser gang. In other words, the switch brackets should be fastened to the chassis by means of the front and rear condenser-mounting screws. After the holes have been drilled in the switch brackets, remove the front bracket, fasten it down with the front condenser-mounting screw, slide the front of the switch into the front bracket, fasten with the shaft nut, and then fasten the rear switch bracket with the rear condenser-mounting screw.

Mount the tube sockets with the plate terminals toward the nearest switch wafer. The r.f. chokes are mounted in pairs on either side of the tube sockets, centered about an inch from the centers of the tube sockets, with the grid choke toward the front and the plate choke at the rear. The one exception is the 40-meter grid choke which is fastened with the same screw holding the 80-meter coil form. The form is centered $1\frac{3}{8}$ inches from the front of the chassis.

The two grid trimmers, C_{19} and C_{23} , are mounted vertically underneath, C_{19} just to the rear of the second wafer and C_{23} immediately behind the third wafer. Half-inch holes are drilled in the sides of the box and the chassis lips are notched out so that these condensers can be adjusted from the outside. The three plate trimmers are fastened on top of the chassis, using the nearest choke-mounting screw to fasten the grounded side to the chassis. The other terminal of the trimmer is soldered directly to the appropriate tuning-condenser stator terminal. These condensers can be adjusted through one of the ventilating holes in the top cover. It should be mentioned that some brands of 30- μ fd. trimmers have a mounting hole on one side only. If the mounting hole is used to ground the condenser in these types, the adjusting screw will be "hot," necessitating the use of an insulated screwdriver for adjustment.



Top interior view of the frequency multiplier showing the tubes, coils and the tuning-condenser gang. The 30-meter coil is in the foreground with the 6AK6 to the right. The 40-meter coil and plate trimmer are behind the 6AK6 with the 7-Mc. 6C4 to the left. In the second section to the rear, the 14-Mc. coil with its 21-Mc. tap is to the left, followed by the 28-Mc. plate trimmer and tube. The 20-meter 6C4, its plate trimmer and the 28-Mc. coil are to the right. The lips along the top edges of the box are duplicated on the bottom.

It is preferable to use a type that has a mounting hole at each terminal so that the outer plate, instead of the inner, can be grounded.

Coils

Approximate inductance values for the coils are given under Fig. 1 for the benefit of those who must wind their own. However, the use of the B & W Miniductor coils has the advantage that the original coil dimensions can be duplicated closely. This is necessary if pruning of the coils for tracking is to be avoided. The 80-meter coil, L_1 , is wound on a Millen bakelite 1-inch diameter form, fastened to the chassis. The other coils are supported by their leads which are soldered directly to the condenser terminals. The 21-Mc. tap on L_3 should be made with a piece of wire about 3 inches long. When the outer ends of the coil are soldered across the condenser terminals, this tap, which comes near the top of the seventh turn, should be bent in a sweeping curve around the outer side of the coil (counterclockwise as viewed from the front) to the end of a wire from the bandswitch, coming up through a hole in the chassis drilled alongside the condenser frame. The tap is soldered to the end of this switch wire. Don't clip off the excess tap length until adjustments for tracking, described later, have been made.

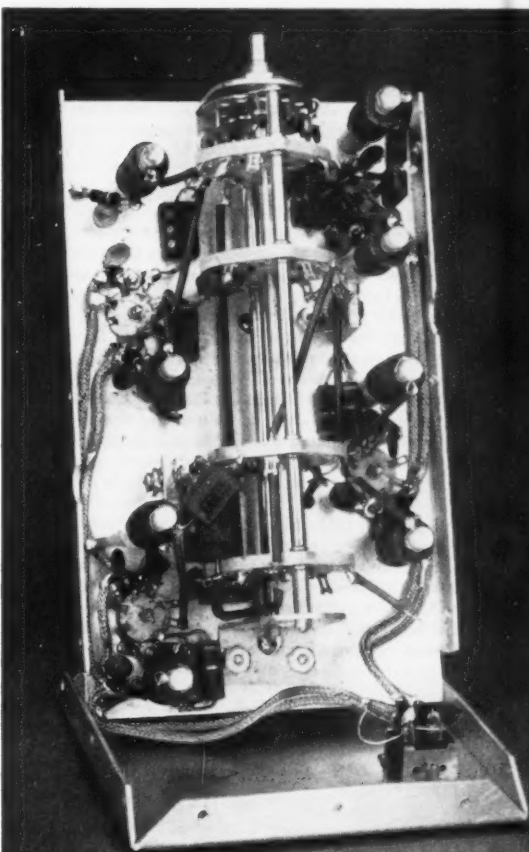
Very little actual wiring is necessary, the resistor and by-pass leads alone being more than adequate in most instances. Short shielded heater and high-voltage leads are run down each side of the chassis, terminating at the power connector at the rear. These leads are by-passed at each stage by the method described in *QST* for April, 1951.² The condenser is soldered with the shortest leads possible between the inner and outer conductors of the wire. The outer shield is then grounded to the chassis at the nearest possible point. Tube-terminal

² Grammer, "By-Passing for Harmonic Reduction," *QST*, April, 1951, p. 14.

Bottom view of the multiplier chassis showing the bandswitch, r.f. chokes and other small components. The 80-meter circuit is at the top, the 10-meter circuit at the bottom. The 20-meter grid trimmer is to the right and behind the second switch wafer. The 10-meter grid trimmer is to the left of the third wafer. This view also shows how the removable back of the enclosure is made. The text describes a somewhat different and simpler method of mounting the switch.

by-passes are also connected with the shortest leads possible. Convenient grounding points can be provided by placing soldering lugs under the socket-mounting screws and also under the r.f. chokes when they are mounted. The remainder of the wiring is done with small bare wire covered with spaghetti, running as directly as possible from point to point.

The Centralab switches have two rotor contacts and C_9 and C_{17} are most conveniently mounted by opening up the lower rotor contact so that it does not make connection with the rotor, and then soldering the condenser between this terminal and the other rotor terminal above. The lower terminal is then used also as a tie point for the preceding 0.001- μ fd. plate blocking condenser and a lead going through the chassis to the tuning-condenser stator terminal above. C_{25} and C_{26} are soldered directly between the contact terminals of the two switch sections, while C_{27} is soldered between the terminal of the switch and the top end of the near-by grid choke, RFC_7 . C_1 is soldered between the input pin jack and the grid terminal of the 6AK6 socket. A short piece of wire connects the last section of the switch to the output jack. These last two connections are the only ones that cannot be made before the chassis has been placed in the box.



Mounting the Unit in a Transmitter

In mounting the multiplier unit on a chassis with other stages, it is not necessary, of course, that it be placed close to the panel. By using extension shafts, it can be placed as far to the rear as desired. However, since the amplifier is coupled capacitively to the output of the unit, the length of leads to the amplifier grid and cathode will have considerable influence on the tuning and the power delivered to the grid of the amplifier, especially at the higher frequencies. The unit should be fastened securely to the chassis and the amplifier tube mounted close to the output terminal. The grid of the amplifier should be connected to the output terminal of the multiplier unit with a short wire well spaced from the chassis, and the cathode of the amplifier should be grounded or by-passed immediately to the chassis. If the grid wire, or the path from the amplifier cathode to the multiplier box is much over 6 inches long, there may be a noticeable loss in output at 28 Mc., and it may not be possible to resonate the higher-frequency multiplier circuits.

It is preferable also to have the oscillator located on the same chassis as the multiplier unit so that the coupling leads will be short. However, if the oscillator has the power and tuning range to spare, a piece of coax cable can be used, as shown in Fig. 2. In order to do this, it must be

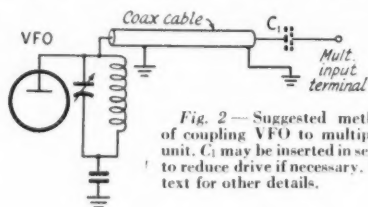


Fig. 2 — Suggested method of coupling VFO to multiplier unit. C_1 may be inserted in series to reduce drive if necessary. See text for other details.

possible to retune the oscillator output circuit to compensate for the capacitance of the cable. With VFOs having only link-coupled output, it may be possible to obtain sufficient drive to the 6AK6 simply by connecting the link line to the input of the multiplier unit. It all depends on how much output the VFO has to spare. It may help in such a case to shunt C_1 (Fig. 1) with a 0.001- μ fd. condenser. If this doesn't work, it will be necessary to make a connection to the oscillator tank circuit.

Power Supply

A power supply delivering 375 to 380 volts at 60 or 70 ma. is required to operate the unit. To assure adequate output, the supply voltage should be close to this figure. The actual plate voltage — voltage between plate and cathode — will be 40 to 90 volts less than the supply voltage. A suitable circuit is shown in Fig. 3.

Adjustment

Until the unit has been tuned up, no plate or screen voltage should be applied to the

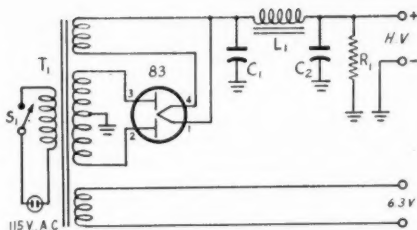


Fig. 3 — Circuit diagram of a suitable power supply for the frequency-multiplier unit.

C_1, C_2 — 16- μ fd. 600-volt wkg. electrolytic.

R_1 — 50,000 ohms, 10 watts.

L_1 — 12-hy. 80-ma. filter choke.

S_1 — S.p.s.t. toggle switch.

T_1 — Power transformer: 350-0-350 volts r.m.s., 70 ma.; 6.3 volts, 2.5 amp.; 5 volts, 3 amp. (Stancor P-4078 or equivalent).

amplifier. Means should be provided for checking the amplifier grid current, or the voltage across its grid leak. While it should be possible to make adjustments without metering the multiplier unit, the job will be a little easier if a milliammeter is inserted in the high-voltage lead to the power supply, at least.

With the switch in the 80-meter position, turn on the oscillator and tune it to 3500 kc. (1750 kc. if the oscillator output is at 160 meters). If the oscillator is crystal-controlled, use the lowest-frequency crystal at hand. Now resonate the multiplier for maximum drive to the amplifier. With the multiplier tuned to resonance, adjust the coupling to the oscillator to give maximum drive to the amplifier. The 6AK6 is rather critical as to excitation. Maximum output should occur with the oscillator developing a bias of 15 to 30 volts across the grid leak of the 6AK6. If no other means is available, the drive to the 6AK6 can be reduced by inserting a mica condenser of proper size in series with the wire to the input terminal of the multiplier unit, as indicated in Fig. 2. If a VFO is used, the multiplier should be checked at both 3500 and 4000 kc. to make sure it is covering the proper frequency range. (The multiplier must always be retuned, of course, for any appreciable change in oscillator frequency.) It may be necessary to spread out the last few turns of L_1 on the coil form to get the circuit to hit both ends of the band. Drive to the amplifier should be essentially the same anywhere in the band, providing the output of the oscillator is reasonably constant.

With the 80-meter stage working properly, the switch should be turned to the 7-Mc. position. Set the VFO to 3500 kc. and resonate the multiplier. If there is no indication of drive to the amplifier, it may be necessary to adjust the 7-Mc. trimmer, C_{16} , a little bit at a time, retuning the gang, until an indication of output is obtained. As an aid, a milliammeter in the high-voltage lead should show a dip when C_{16} is tuned through resonance. When an indication is obtained, tune the gang for peak drive and then

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Automotive Radio Noise Elimination

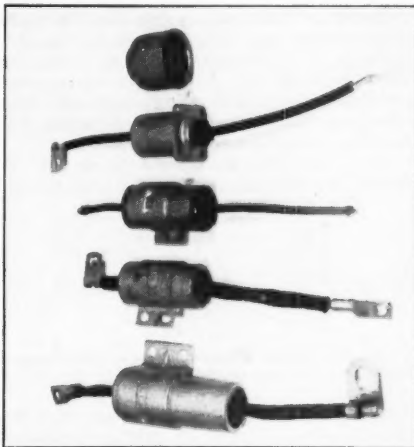
Up-to-date Methods Based on Engineering Research

BY BROOKS H. SHORT,* W9DPI

EVERY automobile includes a number of sources of radio interference. The function of the electrical components makes them potential producers of noise, and to eliminate the sources of noise would mean rendering the vehicle inoperative. There is nothing more sorry than a car that will not run, unless it is a rig that will not put out.

In 1938 the Engineering Department of the Delco-Remy Division of General Motors Corporation went to work to see what could be done to reduce the undesirable radiations from vehicles using their electrical equipment. A group of qualified engineers has been working on the problem since that time; and, although it has not been completely solved, we have made a lot of progress. It is the purpose of this article to acquaint the mobile ham with the few simple steps

• Most of the curatives for car noise that hams apply are based on cut-and-try, and sometimes the process is not only time-consuming but ultimately disappointing. This article gets into the basic causes of generated noise and describes methods, developed over a long period of time in the automotive laboratories, that are based on sound engineering principles and that have been proved to work.



Coaxial or feed-through condensers used in suppressing automotive noise. These particular units are made by Delco-Remy, but similar ones are available from several manufacturers of radio capacitors.

that in some cases will completely eliminate his interference, and in others will reduce it to negligible magnitude. In considering the noise sources and their suppression, we will break the automotive electrical system down into its component parts, as this attack makes for clarification of the problem.

The Ignition System

There are three sources of noise in the ignition circuit. The first is of little importance to the

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amateur, but will be discussed in the interest of giving the complete story. After the contacts have been opened and after ignition has occurred, the condenser in parallel with the breaker points becomes charged to the full potential of the car battery. When the contacts close to build up energy in the coil primary for the next ignition impulse, that condenser is shorted by the breaker points. The energy that had been stored in the capacitor now proceeds to send current through its lead, the breaker points, the ground plate, and the capacitor mounting bracket. Since each part of the path has physical dimensions, there is an appreciable amount of inductance in series with the capacitor. That inductance combined with the capacity of the condenser forms a resonant circuit tuned to a frequency in the broadcast band. There is nothing we can do to eliminate this source of noise other than nesting the components well down in the distributor bowl, where the natural shielding of that bowl prevents the noise from becoming objectionable. Such positioning has been done in the Delco-Remy distributors.

The second source of noise in the ignition system lies in the distributor proper and operates each time the gap between the rotor and a cap insert breaks down. The amount of noise formed here is proportional to the value of the voltage before the gap breaks down, and the frequency spectrum generated is a function of how long it takes to break the gap down completely. Students of advanced electrical engineering have a concept that is very applicable here. They call this operator a "unit function," and what it means is that up to the instant when the unit function acts, the circuit was operating under one group of conditions, and after the unit function operated an entirely different group of conditions obtained. For example, let us imagine we are entering a dark room. We turn on the light switch or let the unit function operate, and we have current in the wires and have light. Every time a gap breaks down, we think of it as a unit function operating, with a new group of

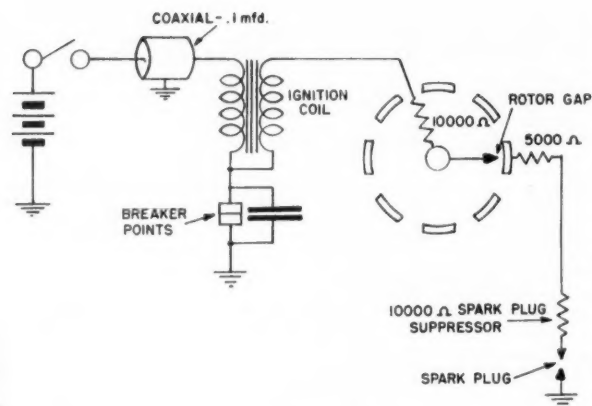


Fig. 1 — Ignition system with recommended suppression methods.

conditions following the operation. In all subsequent discussion we will talk about circuit changes that are capable of producing noise as operations of the unit function. In this source of noise, the ignition coil is raising the potential of the wire from the coil high-tension terminal to the distributor center terminal along approximately a 2500-cycle-per-second wave. When the potential gets to approximately 8000 volts, the distributor gap breaks down and an arc is established between the rotor electrode and the cap insert. When this arc is established the capacitances of the high-tension lead, from the distributor to the corresponding spark plug, and that of the spark plug itself are connected to the secondary. The sudden increase in capacitance causes the voltage to fall to a very low value. This change in voltage is the source of the radio noise under consideration.

To suppress this second source of ignition noise we have found suppressor resistor units to be very effective. The source of noise may be thought of as a battery or generator. To prevent that generator from sending high-frequency currents into either wire we insert suppressors so that the generator is looking toward high impedance, which discourages the source from sending out interference. We have found that 5000-ohm suppressor units in each of the spark plug towers of the distributor, along with a 10,000-



Fig. 2 — Conventional type by-pass capacitor. Because units of this type have considerable inductance, their by-passing effectiveness is poor except for a narrow range in the vicinity of 2 Mc., as shown in Fig. 3.

ohm suppressor in the distributor center tower, does a good job of suppressing this noise.

There are a number of effective suppressor

units available. A good suppressor element should be molded of material having low capacitance. The resistor material should have the same resistance, or near it, at high voltage as at low voltage. We have found the Erie model L7VR-10ME 10,000-ohm units and the L7VR-5ME 5000-ohm units to be very effective.

The third source of noise in the ignition system occurs at the spark plug. The spark plug has been raised to some voltage between 8000 and 22,000; the plug then breaks down, and the voltage persists at approximately 1500 volts. This change in potential occurs very rapidly, creat-

ing a noise of great magnitude over a wide frequency spectrum. Again we have found suppressors the best way to reduce noise. A 10,000-ohm unit should be used at each spark plug. There are a number of considerations from the academic viewpoint why the resistor slug should be built into the spark plug. There are also reasons why it should be an external unit. From a practical view, we would not differentiate between the two approaches. Ten thousand ohms at the plug, either built into the spark plug or mounted externally, should do a comparable job.

Any of the three sources of noise may be reflected into the secondary of the ignition coil,

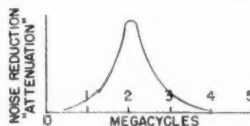


Fig. 3 — Typical attenuation curve of a by-pass condenser of the type shown in Fig. 2.

sent to the primary through the capacity of the coil, and then appear at the battery terminal of the coil with enough energy to drive the wires of the 6-volt system with noise. This is important since all light wires are connected to the 6-volt battery along with the ignition supply lead. To discourage such transients from driving the 6-volt leads, some kind of filter seemed to be indicated. A rather complete study was made of the filtering effects of by-pass condensers, and it was found that the usual 0.3- μ fd. condenser was of little value. Referring to Fig. 2, we show a 0.3- μ fd. capacitor with a total lead length of 1 inch. We hardly see how the condenser could have much less lead length. The by-passing action of this capacitor is shown in Fig. 3. We find at 2.03 megacycles this unit is very effective, but by the time we get to 4 megacycles the capacitor is of negligible value as a by-pass.

To get around the difficulties with such capaci-

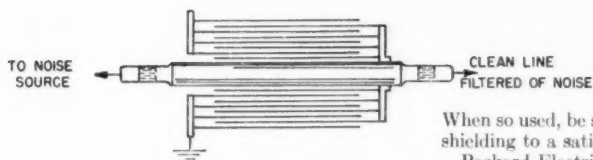


Fig. 4 — Construction of the coaxial or feed-through type by-pass condenser. A typical attenuation curve for this type of unit is shown in Fig. 5.

tors, a number of engineers, in different organizations, arrived almost simultaneously at a by-pass unit having very low inductance. Their reasoning was that if we could cancel the inductance out in the same way we do when we wind a noninductive resistor, we could make a by-pass unit that would be effective to a much higher frequency. Such a by-pass unit is shown in Fig. 4, with its attenuation or noise reduction characteristics shown in Fig. 5. In the construction, the core diameter should be large and the winding should be as thin in the radial direction as is possible, to get the best inductance cancellation.

The photograph shows some coaxial capacitors as manufactured at Delco-Remy.¹ Most capacitor manufacturers are now making these feed-through capacitors, and at least one has been featuring his product in a national advertising campaign.

One of these coaxial capacitors should be mounted as close to the battery terminal of the

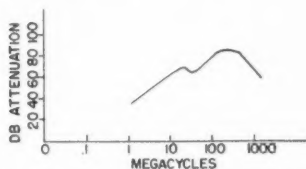


Fig. 5 — Attenuation curve for a feed-through type by-pass condenser. This is representative of units having a capacitance of 0.1 to 0.25 μ fd.

coil as is practical, with the core of the capacitor inserted in the lead from the ignition switch to the ignition coil. Such installation will usually discourage any high-frequency energy from getting back into the low-voltage wiring of the vehicle. In stubborn cases, two feed-through capacitors may be used with a radio-frequency choke between them. The value of the choke has to be determined by trial-and-error for the particular installation. In making such a choke, be certain that the wire used has sufficient cross-sectional area to carry the current with negligible drop.

In some particularly stubborn installations, even more suppression is required to clean out the ignition noise. The only known way to clean out the residual after all the above steps have

¹ Delco-Remy does not have a distributor set-up for selling such capacitors to individuals, but similar units may be obtained from a number of capacitor manufacturers that sell through regular radio distributors.

been taken is to use metallic shielding. Double-braid shielding may be pulled over the high-tension leads to take care of this residual.

When so used, be sure to ground both ends of the shielding to a satisfactory ground.

Packard Electric Division and Pontiac Motor Division of General Motors Corporation have given us a way to do away with the suppressors at the distributor cap and at the spark plugs. They have made use of a special nonmetallic high-tension cable. This "wire" has approximately 3500 ohms per foot of length, and is used for all high-tension leads in the 1951 Pontiac product. This cable is somewhat superior to "lumped" constants. If the lead lengths as used on the 1951 Pontiac will fit your car, these leads do a beauti-

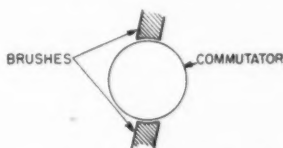


Fig. 6 — Generator commutator and brushes. Current flows from commutator segment to brush by means of tiny arcs.

ful job of suppressing ignition noise. Do not attempt to shorten these leads as they have terminations at each end, and trying to shorten them will result in disgustingly short life.

The Generator

The generator includes two sources of noise. The first is of interest to us because it is the reason why automotive brushes last so long. Referring to Fig. 6, we have two brushes carrying current to and from the commutator. The accepted theory is that the brushes are not in mechanical contact with the commutator, but are held away by a film of gas. The current is conducted between the two elements by a group of parallel arcs. If more current is carried, we have more arcs. The arcs are continually forming and dying out so that no one arc persists for very long. As each arc forms, it acts like the unit function we considered in

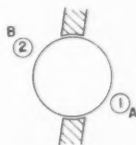


Fig. 7 — In commutation, conductors 1 and 2 reverse their positions with respect to the brushes. A rapid reversal of the direction of current flow takes place while a coil is shorted by a brush.

ignition. This sputtering, formation and decay of conducting arcs is one source of noise.

The second source of noise arises from the commutation. In Fig. 7, (1) and (2) indicate con-

ductors on opposite sides of an armature. When wire (1) is at A it will be carrying current into the page, and the wire (2) at B will be carrying it out of the paper. If we take a later period of time, when the armature has rotated through 180 degrees, we find wire (1) now at B, and so carrying current out of the page, and (2) will be at A, and will be carrying current into the page. In other words, sometime during the rotation the current in the coils has been reversed or commutated. This commutation took place while the coil was shorted by the brush. If we look in our textbooks we find a picture similar to that of Fig. 8 at a. This is known as linear or perfect commutation. This kind of commutation can be had in a generator designed for one output voltage, one output current, and operated at one speed. Our automotive generators operate over wide speed ranges and are called upon to deliver widely varying currents and voltages. For that reason we sometimes get currents like those of B of Fig. 8. When such operation is had we must in practically no time change the current by 50 per cent of its normal value. This rapid change is again a producer of radio noise.

Both of the sources of noise in the generator may be eliminated by using a 0.1- to 0.25- μ fd. coaxial capacitor in the generator armature cir-

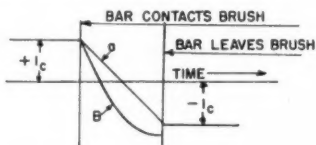


Fig. 8 — "Linear" commutation is shown at a. The curve at B is representative of practical operating conditions in a car generator, and the rapid change in current causes commutation interference.

cuit. This condenser should be mounted as near the armature terminal as is possible and must be mounted directly on the generator frame.

There is one other effect in the generator that is of interest. The generator armature shaft and lamination assembly is positioned by an insulating film of oil or grease at each bearing. For a number of reasons, that armature during rotation picks up an electrostatic charge. The charge proceeds to grow and raise the potential until the film of oil breaks down. At breakdown, radio frequencies are produced as determined by the size and shape of the generator considered as a cavity resonator. To eliminate this "shaft hash" we have found an arrangement similar to Fig. 9 to be desirable. A brass ring or flange is pressed upon the shaft. This ring is then grounded by a spring-loaded grounding brush. To be effective, this shaft grounding device must be on the drive or pulley end. This effect is probably of negligible importance unless the mobile rig is being operated on two meters.

The Regulator

The regulator unit is charged with more noise than any other component in the automotive

electrical system. The energy for the so-called "regulator noise" comes from the field of the generator. Referring to Fig. 10, we have drawn the circuit diagram of the generator and the portion of the regulator that has to do with noise generation. After a certain minimum speed has been reached, either the current regulator con-

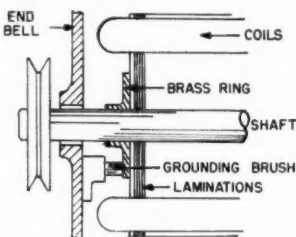


Fig. 9 — Method of grounding the generator shaft to the end bell to eliminate "shaft static."

tacts or the voltage regulator contacts vibrate. Let us consider what happens during one cycle of that vibration. To examine the circuit we must assign values to the circuit components. Let us assume the voltage output of the armature is 7.2 volts, the field resistance is 3.6 ohms, and the regulator resistance is 45 ohms. With the contacts closed we have a field current of 7.2/3.6 or 2 amperes. This 2 amperes also represents an amount of energy that has been stored in the magnetic field of the generator. We like to think of the stored energy in terms of money that has been deposited in the bank. Circuits are just like people, in that they do not like to undergo change and are willing to expend their savings in order to oppose any change. Thinking along this line, let us now consider the circuit of Fig. 10. Let us assume that the voltage regulator contacts open, placing the regulator resistor in series with the field. At the instant of opening, the field sees a change coming and doesn't like that change — it reasons that it is willing to expend its savings

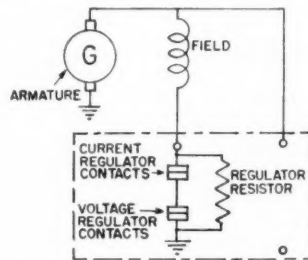


Fig. 10 — Regulator circuit in which radio-frequency noise originates.

to oppose that change, and for the first instant at least it does oppose the change and does sustain the 2 amperes that was flowing before the points opened. Looking at the regulator end we find that the 2 amperes must now flow through the 45

ohms, resulting in an instantaneous rise in voltage of $2\frac{1}{2} \times 45$ or 90 volts. This source of noise is very ragged sounding, since the regulator contacts do not have a fixed frequency of operation but operate only as called for by the load on the generator or the condition of the battery.

To eliminate regulator noise we have found the use of two coaxial condensers and a small resistor capacitor to be effective. Place a 0.1- to 0.25- μ fd coaxial capacitor between the battery terminal of the regulator and the battery, with its case well grounded. Use a second capacitor of the same size in the lead between the armature terminal of the generator and the generator terminal of the regulator with its case also well grounded. The third unit should be connected between the field terminal and ground. This unit consists of a 0.002- μ fd. condenser with a 4-ohm carbon resistor connected in series. Never use a capacitor across the field contacts or between field and ground unless you also use the resistor, for such application will result in greatly reduced regulator life. A sketch of how the regulator may be suppressed is shown in Fig. 11.

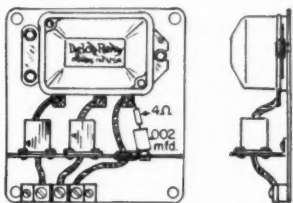


Fig. 11 — The right way to install by-passes to reduce interference from the regulator. A condenser should never be connected across the generator field lead without the small series resistor indicated.

In some cases it is desirable to pull double-braided shielding over the leads between the generator and regulator. If the application of Fig. 11 does not reduce the noise to a sufficiently low level, it is suggested that such be done. Since the normal car wiring system has these leads braided in a group with other leads, it is suggested that the two leads between the generator and the regulator be replaced so that the shield can be applied to the two leads only. When such a shield is used it must be grounded well at both ends. In the most difficult cases even the shielding may not give the desired degree of suppression. When such is the case one may accomplish the desired quieting by insulating the regulator from the car chassis. The shield is then connected to the regulator case at one end and to the generator frame at the other. Noise cancellation is then obtained because the fields set up by high-frequency currents flowing in the armature or field leads are cancelled by fields set up by the returning current in the shielding. In the majority of cases the last two procedures are not necessary.

General

Most installations get power for the radio gear at some junction remote from the battery. This

means that although we are supplying the receiver with pure d.c. from the battery, the lead between that junction point and the battery has considerable impedance at high frequencies. Quite often the IZ drop in the lead contains high frequency which gets into the receiver by the "back way." When this condition is the cause of trouble, much can be accomplished by using a separate lead directly between the radio receiver and the "hot" battery terminal.

When suppressing a vehicle it is quite often desirable to be able to pick out the various noises. Ignition noise varies in repetition rate with engine speed and can be recognized, at least during the early stages of your work, by that characteristic. When you are nearly done, this noise takes on the sound of corn popping, and apparently does not follow engine speed. When you are at this point it is recommended that all leads be removed from the generator so that the only sources of noise left are in the ignition system.

Regulator noise and generator noise may be detected by racing the engine and cutting the ignition switch. Since turning off the ignition switch kills all ignition noise, and since the generator and regulator continue to operate until the engine has coasted down to the "cut-out" speed of the generator, this is a way of getting only the generator and regulator noises. The generator noise may easily be distinguished since it is a somewhat musical whine, while the regulator interference is a ragged, rasping, irregular noise.

Some cars have electrical gauges that cause interference. If you have "thrown the book" at your car and haven't reduced the noise to a satisfactory level, we would recommend that you examine the gauges. A small capacitor located near the gauge-sending unit will usually clean up such noise.

Good luck to you in your hunt and elimination of automotive electrical interference. But please don't come back to us with the question of what do we do with the *other* guy's car!

Silent Keys

It is with deep regret that we record the passing of these amateurs:

- W1BAW, Ralph T. Beaudin, Production Manager and Assistant Circulation Manager of QST.
- W1FCO, L. M. Craven, West Hartford, Conn.
- W1ILQ, Charles L. Richardson, Amston, Conn.
- WN1TWS, Norman E. Babbitt, Auburn, Me.
- W2ADE, Howard T. Barker, Buffalo, N. Y.
- W2CKU, Edward C. Homer, Southampton, L. I., N. Y.
- W2UDD, Norman A. Hansen, jr., Buffalo, N. Y.
- W3EPT, George T. Williams, Glen Echo Heights, Md.
- W4EGF, Linville H. Clemmons, High Point, N. C.
- W4KAD, Guy E. Brown, East Point, Ga.
- W7DSZ, Roy O. Johnson, Tacoma, Wash.
- ex-8ANJ, Wayland C. Marlow, Granville, O.
- W9BOM, Bert J. Nelson, Kenosha, Wis.
- W9CCJ, Melvin B. Osborne, Indianapolis, Ind.
- ex-W9ZJF, John D. Rice, Washington, D. C.
- W0ISU, F. E. Brown, Windsor, Mo.
- VE3AKL, Carl G. Heilig, Oakville, Ont.
- VE3NI, James A. MacArthur, St. Thomas, Ont.



An Elevator Mast

How To "Lower the Boom" in a Hurry

BY JOHN D. AVERY,* WIIYI

How many times after your 10- or 20-meter beam has been installed on top of a high tower have you wished changes could be made? Undoubtedly many times but, if you are anywhere near average, you have probably left it "as is" and not made the changes, because of the difficulty involved in working on the beam at any height. A 90-mile-per-hour gale brought down our old wooden tower, and we decided that the next tower would not only stay up but it would allow convenient working on the beam. This article will describe the solution we worked out and have used to our complete satisfaction.

The new tower was to be made of such material and construction that it would stand high winds, and it must allow convenient working on any part of the beam and rotator. It was finally decided that the only approach we could use was one that permitted the beam and rotator to be lowered to the ground with a minimum of effort and inconvenience. Several weeks of sketches and planning evolved the design to be described, and much of the drafting and mechanical work was done by my 16-year-old son, John Phillip, in his home workshop.

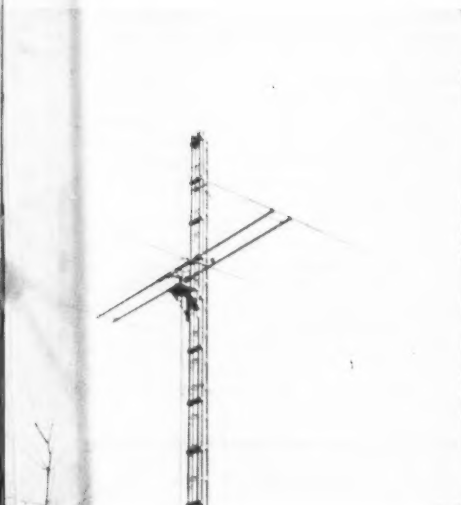
The Elevator Mast

The mast itself is a 40-foot steel Wincharger tower, set in a $5 \times 5 \times 3$ -foot concrete base. Although these towers are self-supporting up to 40 or 50 feet when properly mounted, this mast is

* R.F.D. 1, Rockville, Conn.



The WIIYI beam at the top of the mast (upper left), on its way down (left center), and on the ground and ready for alterations (left bottom). Below: A close-up view of the hand-driven winch used for raising and lowering the carriage. The bottom set of guy wires anchors to the corners of the concrete base.



guyed at three places with No. 8 steel wire and turnbuckles. The bottom set of four guys is tied to anchor bolts set in the corners of the concrete base. The upper guys are sets of three each. When lowering the beam and rotator, it is necessary to unhook two each of the top and center guys, to permit the beam to pass. The ground anchors also have large eyes and it is a simple matter to loosen the turnbuckles and slip out the hooks.

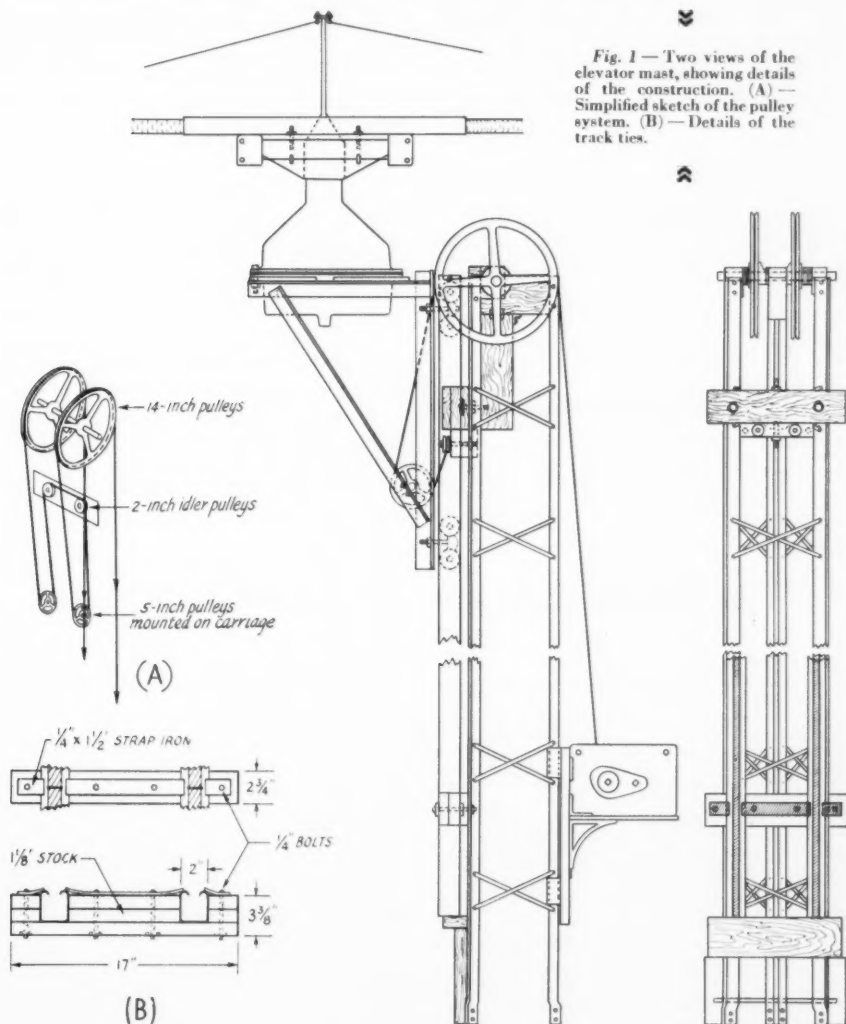
The carriage plus the beam and rotator weighs close to 200 pounds, so heavy track was used to guide the carriage. With a lighter installation, a lighter track could be used. The track itself is made up of eight 10-foot sections of Stanley overhead door track, which comes with ball-bearing trucks. The 80 feet of track and four ball-bearing

trucks cost about \$30.00 from a mail-order house. The other pulleys involved in the hoist are of the standard home-workshop variety and are made of nonrusting material. The cable for the hoist is $\frac{1}{4}$ -inch airplane cable, with a test strength of around 4000 pounds.

The carriage construction can be seen in Fig. 1. It was built up from $2 \times 2 \times \frac{3}{16}$ -inch steel angle flame-welded together. The separation of the two trucks is about 12 inches, center to center.

The ties for the track were made by stacking $2\frac{3}{4} \times 1\frac{1}{2}$ -inch lumber, as shown in Fig. 1B, and bolting it together. The rails are then held in place by pieces of strap iron, as shown in the sketch. The ties are placed every 5 feet up the

(Continued on page 124)



The Double-Spectrum Theorem

A Compatible System for 'Phone and C.W.

BY LARSON E. RAPP,* WIOU

NEW frontiers are not easy to find in amateur radio. Thanks to the untiring efforts of our cellular scientists, practically no communications problem remains unsolved—save one. It was first presented by the late K. B. Warner in a *QST* editorial¹ and received great acclaim as a problem, but no solution was offered at the time. The author had anticipated this problem and offered a straightforward and ingenious solution² that, unfortunately, was never put into practice. It is a sound and workable answer but has the minor drawback of requiring complete cooperation between all of the amateurs in the world.

In all fairness, and for the complete documentation of this paper, it must be said that another solution has already been proposed, involving pulse modulation.³ This proposal met with little general acceptance, probably because it involved unfamiliar equipment. It was also suggested at the time that, being a wide-band technique, it

• It has long been recognized that the best possible solution to the QRM problem is to open all of our bands to both 'phone and c.w. This has not been too popular in the past, however, because of the mutual interference. This article offers an ingenious solution, based on contemporary thinking, that merits your careful study. Who will be the first on the air with it in your neighborhood?

c.w. for DX work. Perhaps its greatest drawback, however, was that it was not an amateur development, but merely a utilization of principles grown out of commercial work. For amateurs, this would never do.

Needless to say, the author has not lost sight of this problem, and a certain portion of each working month has been allocated to it since 1946. We are pleased to present a solution that should be acceptable to everyone, since it has none of the objections of the previous proposals.

Fundamental Theory

A recountal of the many blind alleys that were followed would be of little interest to anyone except those who would care to repeat these many unsuccessful experiments, and thus it will be omitted. The first glimmer of hope came in 1948, when several references were made in the literature to "positive" or "upward" modulation. Heretofore most normal 'phone men had considered modulation to be something that required both upward and downward swings, but this was merely a convenient concept. However, with this coruscation about "positive" modulation, it was not too difficult to postulate a spectrum with "positive" modulation for 'phone signals and "negative" modulation for c.w. signals. Although the author is considered to be a fairly unemotional type, it must be confessed that the first realization of the importance of this invention reduced him to a nervous condition popularly described by the expression "as jittery as a June bride."

This, then, was an approach worth investigating. With positive modulation for 'phone, and negative modulation for code, all that was required was a receiver that would respond only to positive or negative modulation, but not to both. Negative modulation, for obtaining the code signals, presents no problem at all, obviously.

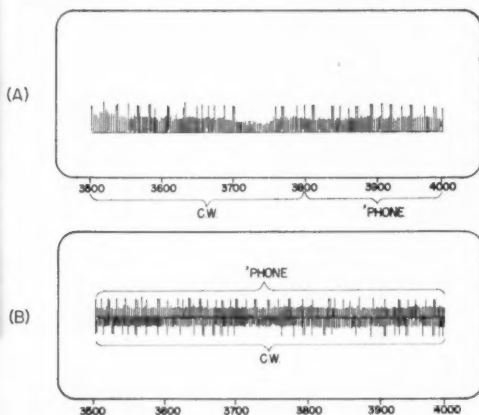


Fig. 1—A typical amateur band (3.5 Mc.) as it might appear on a panoramic receiver at some given instant, *t*. (A) Using present techniques, and (B) using the principles outlined in this article. The double-spectrum theorem provides for operation of both 'phone and c.w. signals on the same frequency without mutual interference.

would not be acceptable to high-selectivity addicts and manufacturers of sharp receivers, not to mention the fact that it is inferior to ordinary

* Kippering-on-the-Charles, Mass.

¹ K. B. W., "Wanted: A Second Spectrum," *QST*, Dec., 1947.

² Rapp, "The Staggering Band Theorem," *QST*, April, 1947.

³ Griffin, "Narrow-Band Pulse Transmission," *QST*, July, 1949.

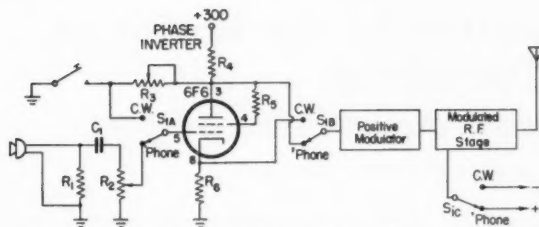


Fig. 2 — The basic transmitter circuit. S_1 switches the transmitter for 'phone or c.w. operation.

C_1 — 0.01- μ fd. 400-volt paper.

R_1 — 1.0 megohm, $\frac{1}{2}$ watt.

R_2 , R_3 — 1-megohm volume control, linear taper.

R_4 , R_6 — 10,000 ohms, 2 watts, matched within 5 per cent.

R_5 — 470 ohms, 1 watt.

S_1 — Three-pole 2-position rotary switch (ceramic insulation).

Using the pedicular circuits that 'phone men use for positive modulation, a phase inverter and a d.c. amplifier (for the keyed characters) represent all of the additional equipment necessary. Since the d.c. amplifier will also pass audio frequencies, the same modulator can be used for both 'phone and code work, and it requires only switching of the input from microphone to key and the selection of the properly-poled output from the phase inverter. The basic circuit is shown in Fig. 2. Any of the common circuits for positive modulation can be used — some variations of clamp-tube modulation are very popular in this application — and your favorite circuit is the right one for you to use. A 6F6 is shown in the phase-inverter circuit, but one section of a 6SN7 can be used if desired. The audio quality is about the same in either case. The control, R_3 , is set to the position that gives chirpless and clickless keying, and in some instances a small 100- μ fd. mica condenser may be required across the key contacts. As shown, the circuit cannot be used for break-in operation with either c.w. or 'phone, unless some type of voice-control and oscillator hold-in circuit is used. The hold-in circuit is coupled at the switch arm of S_{1A} .

Receiving the Double Spectrum

Fortunately, the receiving system represents no new or unfamiliar techniques, and many receivers are already in a suitable condition for receiving 'phone (or c.w., but not both) signals of this new type. There are many limiters in receivers that work on the positive (or negative) peaks, and all that is required is a combination limiter that will work on one or the other. The circuit in Fig. 3 shows one way that it can be done — no doubt many other possibilities will occur to discerning readers. This circuit can be built as a separate unit and coupled to any receiver between the detector and the first audio stage, or it can be built into the receiver.

The operation of the receiver circuit is easy to follow. Depending upon the position of S_1 , all

positive or negative modulation will be short-circuited by the crystal diode, and only the modulation of opposite polarity will reach the grid of the amplifier. Note that this requires d.c. coupling from the diode load resistor, R_4 , and the absence of a coupling condenser is deliberate. There is some difference in performance among the crystal diodes, and the new rhythmic 1N2N proved to be the best in this particular application.

When you want to receive 'phone signals, switch S_1 (Fig. 3) to "PH." and only signals with positive modulation will come through. If code is your pleasure, switch S_1 (Fig. 3) to "C.W." and tune in your favorite "CQ DX." One of the first things you will notice, after you have grown accustomed to the use of this adapter, is that you will occasionally hear 'phone signals when S_1 (Fig. 3) is in the "C.W." position, or c.w. signals when S_1 is turned to "PH." This indicates that the 'phone (or c.w.) signal is not using pure positive or pure negative modulation, and the operator will doubtless welcome a call that tells him his equipment is slightly out of adjustment.

A few astute readers may have noticed that

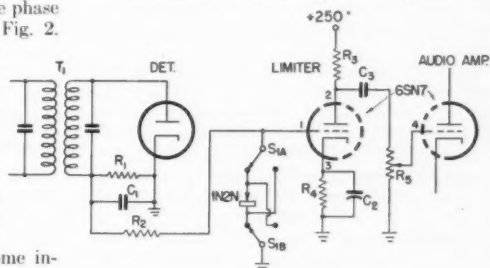


Fig. 3 — The receiver adapter circuit.

C_1 — 470- μ fd. mica or ceramic.

C_2 — 10- μ fd. 25-volt electrolytic.

C_3 — 0.02- μ fd. 400-volt paper.

R_1 , R_2 — 1.0 megohm, $\frac{1}{2}$ watt.

R_3 — 47,000 ohms, 1 watt.

R_4 — 1000 ohms, $\frac{1}{2}$ watt.

R_5 — 1.0-megohm volume control, linear taper.

S_1 — D.p.d.t. rotary switch, low-loss.

T_1 — I.f. transformer.

like the previous proposal,² this solution requires the cooperation of all amateurs in switching over to these new methods of modulation, for complete success. However, since many 'phone men are already embracing positive modulation techniques, we feel certain that this proposal will meet with instant acceptance. You can change your transmitter over now and modify the receiver later (accepting some QRM in the meantime), or you can go whole-hog and immediately enjoy the fruits of a double spectrum.

[It is recommended that readers who do not fully appreciate the significance of the present disclosures wait for a subsequent article on complete alignment and tune-up procedures before building the equipment. —Ed.]

A V.H.F. Transmitter for the Novice or Technician

An Easily-Adjusted Rig for Use on Either 145 or 220 Mc.

BY EDWARD P. TILTON,* W1HDQ

A HARD FACT of transmitter design the beginner soon discovers is that it is rarely possible to build a rig that has everything. If one lists the characteristics he wants in a piece of equipment and then tries to build them all into one "dream rig" he is likely to find some conflict between his aims. We can design a simple rig, a low-cost rig, a highly-efficient rig, or a beautiful one, but the chances are good that we won't be able to roll all these objectives into one.

The aim in this case was ease of adjustment, so the inexperienced constructor would not run into trouble when he tried to get the rig going. We wanted operation on either 145 or 220 Mc., to take care of both Novice and Technician. Other desirable characteristics were subordinated to these two. If parts similar to those used in the original model are obtained, and the general layout shown is followed, even the beginner should have little trouble in duplicating the rig successfully.

Basically, the transmitter consists of a 12AU7 dual triode, as a combined overtone oscillator and frequency multiplier, a 5763 pentode doubler, and a pair of 5763s in a "push-push doubler" final amplifier. Crystals in the same general frequency range can be used for either band; in fact, for operation between 146.68 and 147 Mc. or 220.03 and 220.5 Mc. the fellow who has both Novice and Technician tickets can hit both these ranges with a single crystal. Choice of crystal frequencies can be made from Table I.

The rig is not intended for quick band-changing between 220 and 145 Mc. Plug-in coils are practically out of the question for the frequencies for which this job is designed, but the change from one band to the other can be made in a mat-

• With the number of Novice and Technician licensees growing at a rapid rate, there is increased demand for a v.h.f. rig that will provide a good signal on 145 or 220 Mc. and still be relatively simple to build and easy to adjust. The transmitter described here was designed with these needs in mind. The fellow with both Novice and Technician tickets can use it on either band, with a single crystal.

ter of minutes by soldering another set of inductances in position for L_4 , L_5 and L_6 . Output in the 144-Mc. band is comparable to that obtainable with the popular SCR-522, about 10 to 15 watts. On 220 Mc. the efficiency drops, as might be expected, but it is still possible to develop up to about 4 watts output. This is enough to drive an 832A or similar amplifier, or the rig may be used by itself. Even 3 to 4 watts is capable of covering a good many miles on 220, if it is put into a good antenna system.

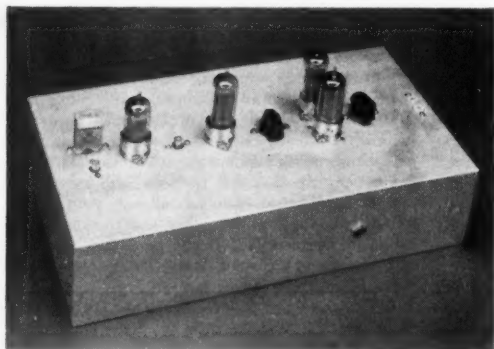
Mechanical and Electrical Details

In laying out this transmitter a principle was followed that is recommended for all beginners, and it's not such a bad idea for the rest of us, either. A chassis much larger than absolutely necessary was used. This makes for an open layout that is easy to wire, and it is good insurance against failures from shorts and other mechanical troubles. The rig could be built in one-fourth the space — if one wishes to try it.

The chassis is aluminum, for easy working, 7 by 13 by 3 inches in size. (Johnson No. 194-361.)

Layout of parts is not extremely critical, but the in-line arrangement shown provides a symmetrical wiring job, with short leads in the circuits

* V. H. F. Editor, QST.



A transmitter for use on 145 or 220 Mc. Stages, from left to right, are 12AU7 oscillator-multiplier, 5763 doubler, and a pair of 5763s in the final.

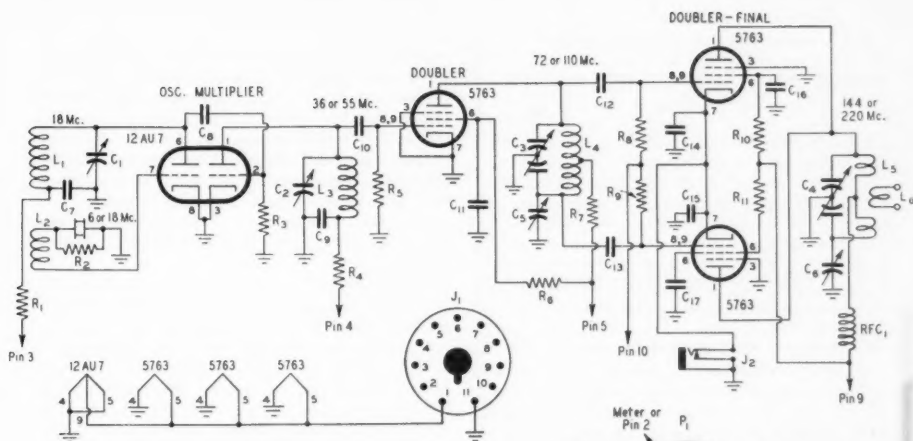


Fig. 1—Schematic diagram and parts list for the Novice-Technician v.h.f. transmitter.

C₁, C₂—50- μ fd. screwdriver-adjustment trimmer (National PSR-50).
C₃, C₄—10- μ fd. per-section butterfly-type variable (Johnson 10LB15).

C₅, C₆—3-30 μ fd. mica trimmer (National M-30).

C₇, C₈, C₁₁, C₁₄, C₁₆, C₁₇—0.001- μ fd. disk ceramic.

C₉, C₁₀—25- μ fd. ceramic or mica.

C₁₂, C₁₃—10- μ fd. ceramic or mica.

R₁, R₄—1000 ohms, $\frac{1}{2}$ watt.

R₂—10,000 ohms, $\frac{1}{2}$ watt.

R₃—100,000 ohms, $\frac{1}{2}$ watt.

R₅—47,000 ohms, $\frac{1}{2}$ watt.

R₆—15,000 ohms, $\frac{1}{2}$ watt.

R₇—100 ohms, $\frac{1}{2}$ watt.

R₈, R₉, R₁₀, R₁₁—18,000 ohms, 1 watt.

L₁—15 turns No. 20 tinned, spaced diam., $\frac{1}{2}$ -inch diameter.

L₂—6 turns, same as L₁. Make both windings from a single 21-turn piece of B & W Miniductor No. 3003.

L₃—6 turns No. 3003.

L₄—145 Mc.: 6 turns No. 14, $\frac{3}{4}$ -inch diam., $\frac{7}{8}$ inch long, center-tapped.

where these characteristics are important. Looking at the top-view photograph, we see the oscillator-multiplier tube at the left, with the crystal and oscillator tuning adjustment, C₁, between it and the edge of the chassis. The first 5763 is just to the left of the middle, with the multiplier plate tuning, C₂, between it and the 12AU7. Next comes the 5763 tuning adjustment, C₃, the two 5763s, and their plate tuning control, C₄. The crystal socket at the far right is the antenna output terminal. On the front wall of the chassis is a jack (J₂) connected between the 5763 cathodes and ground, for measuring the cathode current, or keying the transmitter for c.w.

Remembering this line-up, it is a simple matter to identify the major components in the bottom view. The inductances, from left to right, are the oscillator coils, L₁ and L₂, in one unit, the multi-

plier plate coil, L₃; 5763 plate coil, L₄, and the final plate and antenna coupling windings, L₅ and L₆.

Power leads made with shielded wire are brought out to an 11-pin fitting on the back wall of the chassis. Note that this is a plug-type chassis fitting; the matching socket goes on the power cable. [This is a standard safety measure that should apply to all power supply cabling, preventing exposure of hot terminals if the cable is accidentally removed while the power is on.]

Now let's consider circuit features, beginning with the oscillator. To hold down the number of stages required to get to the operating frequency, an overtone oscillator circuit was used. We will not discuss at length the principles on which this type of oscillator works, as this information is available in QST¹ and in the Handbook.² The crystal may be in the 6-Mc. range, oscillating on approximately three times the frequency for which it was ground, or it can be an 18-Mc. crystal, in which case the frequency of oscillation will be that marked on the holder. The 6-Mc.

—220 Mc.: 4 turns No. 14, $\frac{5}{8}$ -inch diam., $\frac{3}{4}$ inch long, center-tapped.
L₅—145 Mc.: 2 turns No. 14, 1-inch diam., turns $\frac{1}{2}$ inch apart, center-tapped.
—220 Mc.: U-shaped loop No. 14, made from $4\frac{3}{8}$ inches of wire, with sides 1 inch apart, center-tapped.

L₆—145 Mc.: 2 turns No. 14 covered with spaghetti insulation, 1-inch diam., close-wound, with leads long enough to reach antenna terminal—see photograph.

—220 Mc.: U-shaped loop same width and height as L₅, with leads to reach antenna terminal.

J₁—11-pin male chassis fitting (Amphenol 86-RCP11).
J₂—Closed circuit jack.

P₁—11-pin female cable plug (Amphenol 78-PF11).
RFC₁—Single-layer r.f. choke (Ohmite Z-144).

¹ Tilton, "Overtone Crystal Oscillator Circuits," April, 1951, QST, p. 56.

² The Radio Amateur's Handbook, Chapter 17, 1951 or 1952 edition.

TABLE I

Crystal Frequencies (in Mc.) for the Novice-Technician Transmitter

Operating Frequency	Fundamental Crystal*	Overtone Crystal
144.0	6.0	18.0
145.0	6.042	18.125
147.0	6.125	18.375
148.0	6.166	18.50
220.0	6.112	18.334
225.0	6.250	18.750
Both bands with same crystal	6.112 to 6.125	18.334 to 18.375

* When fundamental-type crystals are used for overtone service, the resultant frequency may not be an exact multiple of the value marked on the holder. Crystals multiplying out close to band edges should not be used until the frequency of oscillation is checked accurately and found to be inside the band.

crystals are plentiful and inexpensive, but adjustment for third-overtone oscillation may be a bit critical. The 18-Mc. cuts cost a little more, and may have to be supplied on order, but they are especially designed for this type of operation, and are extremely easy to use. Any of the better-known crystal manufacturers can supply them, but they may not be on your dealer's shelves.

Output of the oscillator is capacity coupled, through C_5 , to the grid of the other half of the 12AU7. This stage doubles the frequency to 36 Mc., if we are to work on the 144-Mc. band. If 220 Mc. is the aim, the stage is made to triple to about 55 Mc. Tuning to either of these frequencies is accomplished by making C_2 large enough to cover this range with a single coil. It hits 55 Mc. near its minimum setting, and 35 Mc. at about two-thirds in.

The frequency is doubled again in the plate circuit of the 5763, to 72 Mc. for 144-Mc. operation, or 110 Mc. for the higher band. A large condenser could be used at C_3 , to permit covering these two frequencies with a single coil, but we need all the drive to the final stage we can get. Efficiency falls off rapidly as the plate tank capacitance is increased, so we use coils as large and tank capacitance as low as practicable, for both bands.

Balanced tank circuits are used in the last two stages. The split-stator or butterfly-type tuning condensers, C_3 and C_4 , have their rotors grounded,

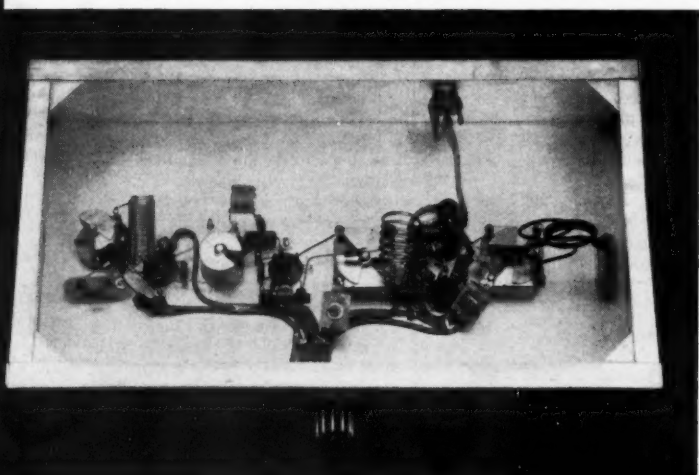
and plate voltage is fed into the center of the coils. In the plate of the first 5763 this type of circuit provides drive to both final grids, with capacity coupling, and in the final stage it makes for a more efficient tank circuit than would be possible at these frequencies with single-ended circuitry. The trimmers C_5 and C_6 balance up the tank circuits, making up for the plate-to-ground capacitance that appears across the other side of these center-fed coils. In the model shown they are adjusted from below the chassis, but they could be mounted the other side up and adjusted from above, if access holes were drilled at the proper points.

The push-push doubler circuit used in the final stage has certain advantages, particularly for the beginner. It is relatively easy to drive, and its efficiency is nearly as good as that of a straight-through amplifier. But its most important attribute, for our purposes, is that the need for neutralization, always a tricky process at these frequencies, is eliminated. You can build a final amplifier that will be somewhat more efficient than this one, but you are not likely to find one that is more sure-fire or easier to adjust.

Why all the pins on the power fitting, J_1 ? This allows metering of all necessary circuits for an accurate tune-up process without using jacks or meter switches. If one is well supplied with meters he can leave as many as he likes permanently connected, and thus observe the operation of several circuits simultaneously. If one meter is used the circuits can be checked one at a time, after which a jumper is connected between the proper terminals of the power cable socket, P_1 , and the meter moved on to the next stage. If the rig is wired as in Fig. 1, metering of the plate current in the oscillator and multiplier, the combined plate and screen current in the other stages, and the grid current in the final can be handled in this way.

Construction

Marking and drilling of the chassis is easier and neater if the wrapping paper is left on. The parts can then be spread out on the chassis experimentally to check the layout. Then draw the layout on the paper, marking hole sizes so that there will be no mistakes in drilling. Check the



Bottom view of the Novice-Technician v.h.f. transmitter. Coils in position are those for operation on 145 Mc.

hole positions for the sockets to be sure that the pins are going to be in position to make r.f. leads as short as possible. The 12AU7 and first 5763 sockets are mounted in similar positions, with Pin 1 at the upper right as seen in the bottom view. The two sockets for the final tubes are mounted with their center lines at a 45-degree angle with the center line of the chassis. They mount so that the No. 1 pins are toward the center line of the chassis, so they can be connected together with a very short lead. When the drawing on the paper is completed and checked, center-punch through the paper for all holes and proceed with drilling.

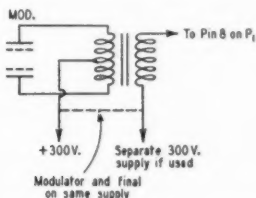


Fig. 2—Method of connecting modulator to the v.h.f. transmitter. If separate power supplies are used on modulator and final stages, connect as shown with solid lines. The dotted line shows connections for using same supply for both.

Wiring the transmitter is very simple. Except for power leads, most of the connections are made with the leads that are part of the resistors and condensers themselves. It is important to see that leads in the last two stages are kept as short as possible. Use of tie points where needed for support makes a neat-looking job and facilitates servicing. They may be seen in the bottom view, serving as supports for the junctions of R_1 , R_3 , R_4 and R_7 , and their respective power leads. A single-lug plate is used for R_1 , and a two-lug plate for the other connections.

Use of shielded wire for power leads, nearly standard practice as a TVI prevention measure in equipment for lower frequencies, is a good habit to acquire. With u.h.f. TV stations coming up, prevention of harmonic radiation is going to be important for the v.h.f. man before long, and shielding of power wiring is the first step in this direction. To use shielded wire easily, cut the braid back a half inch or so, wrap the loose metal ends around the insulation, and run a little solder over the wrap. Where several shielded wires run parallel they may be soldered together, making a wiring job that will stay neatly in place indefinitely.

Adjustment and Operation

For testing we need a power supply capable of delivering 300 volts at 200 ma., but the initial adjustments can be made at 200 volts or less. The lower voltage is desirable as a protection against tube damage, in case operating troubles are encountered. A filament transformer giving 6.3 volts a.c. at 2.6 amperes or more is also needed. This can be built into the transmitter if desired, or it can be part of the power supply.

We check the operation of the oscillator first, with the rest of the tubes in their sockets, but no plate voltage on them. Connect the test supply to Pin 2 of the power cable plug, P_1 , and a milliammeter (50 or 100 ma.) between Pin 3 and Pin 2 temporarily to measure the oscillator plate current.

Apply plate voltage and turn C_1 from maximum toward minimum while watching the meter. Somewhere near the middle of the tuning range there should be a sharp dip in plate current, indicating oscillation. The current will rise gradually as the condenser is opened, and then it will swing up to the original value as oscillation stops. Best operation will be just on the low-capacity side of the point where oscillation started. We should now listen to the note to be sure that oscillation is crystal-controlled. This can be checked on about 18 or 36 Mc., if a receiver is available that covers these ranges, or it can be done on either 144 or 220 Mc.

Listening to the oscillator on about 18 Mc. there should be only a very slight change in frequency as C_1 is tuned; probably not more than the audio range. If there is a continuous and large change as C_1 is adjusted, the stage is oscillating by itself and not under control of the crystal. The indicated frequency change on 144 or 220 Mc. will, of course, be considerably more than on 18 Mc. but the difference between crystal-controlled and self-oscillation will not be hard to observe. The former will produce a pure note, whereas the latter will result in a rough sound, the frequency of which will jump markedly if a metal object is placed near the oscillator coil. Frequency change with vibration is another sign of self-oscillation.

Oscillation other than crystal-controlled indicates that there is too much feed-back. The remedy is to remove one turn at a time from the feed-back winding, L_2 , until only crystal oscillation remains. If there is no oscillation it is usually because of insufficient feed-back, or it might be the result of a defective crystal. Much less feed-back is required with 18-Mc. crystals, and as noted under Fig. 1 the feed-back winding can be reduced to three turns if only this type of crystal is to be used. Feed-back can be controlled by separating L_1 and L_2 mechanically and adjusting the position of L_2 with respect to L_1 , but it is preferable to leave them as one unit if possible, in the interest of mechanical stability.

We can now connect a jumper between Pins 3 and 2 in the plug, P_1 , and connect our meter between Pins 4 and 2, to check the multiplier portion of the 12AU7. Turn C_3 and watch the meter for a dip, as before. Near the middle of the range of C_3 there should be a pronounced dip, indicating the second harmonic of the oscillator frequency, and near minimum capacitance there should be a lesser dip for the third harmonic. If this cannot be found, but the one at 36 Mc. shows up well, the coil L_3 is too large. Cut the end turn of L_3 away from the polystyrene strips that hold it in place, and bend it away from

(Continued on page 126)

Happenings of the Month

N.F.M. EXPANDED

Effective March 1st FCC has finalized its proposal, originating with ARRL, to open for narrow-band frequency or phase modulation the entire voice bands 3800-4000 kc. and 14,200-14,300 kc. N.f.m. can now be used on any amateur band where A3 is permitted, except in 1800-2000 kc. where considerations of loran operation block the n.f.m. privilege.

RENEWALS 'WAY BEHIND

In recent months FCC's overloaded amateur licensing unit has been giving preference to issuance of new tickets and letting applications for modifications and renewals pile up. As reported last month, a relaxation of the modification requirements is expected to reduce the load from that source. And as concerns renewals, as also previously reported, the Commission has indicated that if an amateur applies for renewal before expiration date (and so notes the date of application in his logbook or other record) he may continue operation until he hears from FCC even though it is past the expiration date of his license. This concerns renewals only; not combined applications for modifications, change of privileges, etc. So if you applied for renewal even as long ago as last December (but before expiration of your ticket) don't be alarmed if you haven't had word from FCC as to its action; the staff is some months behind. Go ahead and operate. You'll be hearing from FCC eventually.

GRANDFATHER CLAUSE

As February *QST* was going to press we were able to include, on the basis of telephoned information, a brief announcement of the Commission's action in waiving the examination for Extra Class license for persons who were hamming before May, 1917. As a matter of general

interest, we publish below the text of FCC's announcement:

At a session of the Federal Communications Commission held in its offices in Washington, D. C., on the 27th day of December, 1951:

The Commission having under consideration the Notice of Proposed Rule Making in the above-entitled matter in which it was proposed to amend Part 12, "Rules Governing Amateur Radio Service" to provide that the Amateur Extra Class of license may be issued to any person who qualifies for or currently holds a valid amateur operator license of the General or Advanced Class and who can show that he held a valid amateur operator or station license issued by any agency of the United States Government during or before April, 1917:

IT APPEARING, That, in accordance with the requirements of Section 4(a) of the Administrative Procedure Act, general notice of proposed rule making in the above-entitled matter, which made provision for the submission of written comments by interested parties, was duly published in the Federal Register on December 12, 1951, and that the period provided for the filing of comments has now expired;

IT FURTHER APPEARING, That comments were filed by some thirty amateurs, and that, for the most part, these comments were unanimously agreeable to and in favor of adoption of the proposed amendments, except that a few persons expressed some disagreement with the amendments proposed on the grounds that the Extra Class of license is intended to provide an incentive to all amateurs to become highly proficient in all phases of the radio art and that no means is provided by the proposed amendments to test that proficiency or to distinguish between the pioneer amateurs who have demonstrated a high degree of ability in the field of amateur radio technique and those who let radio technique overtake and pass them, but that no request for oral argument was made;

IT FURTHER APPEARING, That the weight of comment is to the effect that any person who held an amateur license prior to April, 1917, and is still an amateur or has come back to amateur radio after a lapse of time may be recognized as a pioneer in the field of radio and in line with the practice of recognition of prior service in the issuance of such documents as registration certificate of Professional Engineers; may be issued an Amateur Extra Class Operator License;

IT FURTHER APPEARING, That authority for the aforesaid amendments is contained in Sections 4(i) and 303(l) and (r) of the Communications Act of 1934, as amended;

IT FURTHER APPEARING, That, since the amendments herein ordered relieve a restriction which otherwise

A distinguished visitor to League Headquarters in February was Captain Henrik Kurt Carlsen, W2ZNM, who was honored by a staff dinner party, following an inspection of the administrative offices and laboratory. Later in the evening, he visited the Headquarters station in Newington, and operated the equipment. In this picture, he is shown examining two of the WIAW kw. transmitters in company with Communications Manager F. E. Handy, WIBDI (left), and Technical Director George Grammer, WIDF. Captain Carlsen was accompanied on the week-end visit by his family. (Hartford Times photo)

QST for



would be applicable this order may, pursuant to Section 4(c) of the Administrative Procedure Act, be made effective upon publication or at any date thereafter;

IT IS ORDERED, That, effective January 1, 1952, Sections 12.21(a) and 12.46(d) of Part 12, "Rules Governing Amateur Radio Service" be amended as set forth in the attached appendix.

FEDERAL COMMUNICATIONS COMMISSION
T. J. Slowie
Secretary

Released: December 27, 1951

APPENDIX

PART 12, RULES GOVERNING AMATEUR RADIO SERVICE, IS AMENDED IN THE FOLLOWING PARTICULARS:

1. AMEND PARAGRAPH (a) OF SECTION 12.21 TO READ AS FOLLOWS:

(a) *Amateur Extra Class.* Any citizen of the United States who either (1) at any time prior to receipt of his application by the Commission has held for a period of two years or more a valid amateur operator license issued by the Federal Communications Commission, excluding licenses of the Novice and Technician Classes, or (2) submits evidence of having held a valid amateur radio station or operator license issued by any agency of the United States Government during or prior to April, 1917.

2. AMEND SECTION 12.46 BY RE-DESIGNATING THE PRESENT PARAGRAPH (d) AS PARAGRAPH (c) AND INSERTING THE FOLLOWING NEW PARAGRAPH:

(d) An applicant for Amateur Extra Class operator license will be given credit for examination elements 1(C) and 4(B) if he so requests and submits evidence of having held a valid amateur radio station or operator license issued by any agency of the United States Government during or prior to April, 1917, and qualifies for or currently holds a valid amateur operator license of the General or Advanced Class.

R.T.M.A. AMATEUR COMMITTEE

Last year a group of amateurs in industry, active in organizational affairs of the Radio-Television Manufacturers Association, decided to reestablish the RTMA Amateur Radio Activities Section which had been dormant since 1946. The Section held an organizational meeting in September, adopting as its principles:

The basic objective of this Section shall be to promote the orderly development and expansion of the amateur radio hobby through cooperation of RTMA with other interested parties.

This objective will be accomplished by the exchange of information with interested groups, by being available for advice and consultations on matters pertaining to amateur radio, and by reviewing the technical aspects of amateur radio as they pertain to the problems of radio and television manufacturers.

The Chairmanship of the new group went to the man who sparked its revival—Al Kahn, W8DUS. Other officers are Vice-Chairman W. J. Halligan, sr., ex-W9WZE, and Secretary R. W. Mitchell, W9LXQ. The section set up three sub-committees:

1) Technical Committee, headed by Al Pichitino, W0EDX, with the objective of reviewing and being available for consultation on the technical aspects of amateur radio as they pertain to the problems of radio and television manufacturers.

2) A Promotion and Education Committee, headed by Larry LeKashmann, W8IOP, with the objective of cooperating with interested groups for the promotion and publicizing of ama-

(Continued on page 32)

Ralph T. Beaudin 1912—1952

There falls to us the sad task of recording the passing, on February 15th, of Ralph T. Beaudin, WIBAW, ARRL's Production Manager and Assistant Circulation Manager.

Mr. Beaudin succumbed to a heart attack while performing supervisory duties connected with the publication of the 1952 *Handbook* at the Rumford Press, Concord, N. H. He was 40; March 21st would have marked the completion of his twenty-fifth year in the service of the League.

At the tender age of 15, Ralph became associated with ARRL as an office boy. He early demonstrated such ability and perseverance that he was soon established permanently in our Circulation Department. Later, as the League's representative in handling sales of ARRL publications through dealers, extensive travel enabled him to amass a host of friends. As the League's purchasing agent, his considerable experience and exercise of keen business judgment proved invaluable assets.

He became Production Manager in 1945, assuming responsibility for ARRL printing matters, not only with respect to *QST*, the *Handbook* and other publications, but also the numerous forms and certificates used daily in League operations. A competent and hard worker always, Ralph's devotion to the League will long stand as an example for the many friends and associates he leaves behind.

The world of amateur radio loses a staunch worker for its advancement; the Headquarters staff of ARRL loses a close friend and respected colleague.



—An informal photo of
WIBAW at his desk

teur radio, of securing cooperation of RTMA members in these objectives, and of originating and suggesting programs which can be undertaken by RTMA.

3) A Legislative and Public Service Committee, headed by W. J. Halligan, sr., with the objective of insuring maximum participation in civil defense by radio amateurs, and of advising on legislative and regulatory matters as they affect amateur radio, and of other such special assignments as may be designated by the chairman of the section.

ARRL has enjoyed participating, by invitation, in the periodic meetings of the new Section, which is becoming active in various phases of amateur affairs. Perhaps of primary interest at the moment is its cooperative attack on the TVI problem. Initially the section followed up the ARRL letters to RTMA and to individual manufacturers. More recently, it has been working with RTMA's service committee, through Carroll Hoshour, W9ELV, to obtain a better understanding on the part of servicemen in the industry concerning the amateur phase of TVI and how it should be handled and solved. An educational program among servicemen is now being set up, and an early feature of that program will be the placement of articles, in magazines primarily covering the service field, dealing with TVI and the amateurs' part in it.

RENEWAL PROCEDURE CHANGE

In early March FCC took action to streamline more of its licensing procedures with the creation of a new application form, 405-A, to be used after April 15th by a number of services, including amateur, in applications for straight renewal of station and/or operator license. By "straight" renewal is meant renewal only, with no modification requested for change of address, call, class of privileges, etc. The form, to be known as the "short-form renewal," consists of three sections, all to be filled out carefully and neatly by the applicant. The first section requires notarization, and then the whole affair is mailed direct to FCC in Washington; it will no longer be necessary to send along your original license with such applications. Two of the three sections are detached by FCC and become their file records; the third is in the form of a tear-out postcard which is authenticated by FCC and mailed back to you to become a renewal "endorsement" of your original license. Both original license and endorsement of renewal must thereafter be exhibited together as the renewed license authorization.

On those parts of the new form which become FCC file records, the following basic information is required:

- 1) Name (exactly as on your license)
- 2) Mail address (exactly as on your license)
- 3) Transmitter location (exactly as on your license, including data on a remote control point if one is authorized)
- 4) Additional data:
 - a) License covered (amateur station, amateur operator, or amateur station-and-operator)
 - b) Class of station (amateur)

WHAT BANDS AVAILABLE?

Below is a summary of the U. S. amateur bands on which operation is permitted as of March 1st. Any future changes will, as usual, be announced by W1AW bulletins. Figures are megacycles. AØ means an unmodulated carrier, A1 means c.w. telegraphy, A2 is m.c.w., A3 is a.m. 'phone, A4 is facsimile, A5 is television; n.f.m. designates narrow-band frequency- or phase-modulated radiotelephony; and f.m. means frequency-modulation, 'phone (including n.f.m.) or telephony.

3,500-4,000	-A1
3,800-4,000	-A3 and n.f.m., Advanced or Extra Class only
7,000-7,300	-A1
14,000-14,400	-A1
14,200-14,300	-A3 and n.f.m., Advanced or Extra Class only
26,960-27,230	-AØ, A1, A2, A3, A4, f.m.
28,000-29,700	-A1
28,500-29,700	-A3, n.f.m.
29,000-29,700	-f.m.
50.0-54.0	-A1, A2, A3, A4, n.f.m.
52.5-54.0	-f.m.
144-148	-AØ, A1, A2, A3, A4, f.m.
220-225	-AØ, A1, A2, A3, A4, f.m.
420-450 ¹	-AØ, A1, A2, A3, A4, A5, f.m.
1,215-1,300	-AØ, A1, A2, A3, A4, A5, f.m.
2,300-2,450	
3,300-3,500	
5,650-5,925	AØ, A1, A2, A3, A4, A5, f.m., pulse
10,000-10,500	
21,000-22,000	
All above 30,000	

¹ Peak antenna power must not exceed 50 watts.

In addition, portions of 1800-2000 kc. subject to restrictions as shown; either A1 or A3:

Area	Band, Kc	Power (watts)	
		Day	Night
Mississippi River to East Coast U. S. (except Florida and states bordering Gulf of Mexico)	1800-1825 kc. 1875-1900 kc.	500	200
Mississippi River to West Coast U. S. (except states bordering Gulf of Mexico)	1900-1925 kc. 1975-2000 kc.	*500	*200
Florida and states bordering Gulf of Mexico	1800-1825 kc. 1875-1900 kc.	200	No operation
Puerto Rico and Virgin Islands	1900-1925 kc. 1975-2000 kc.	500	50
Hawaiian Islands	1900-1925 kc. 1975-2000 kc.	500	200

* Except in State of Washington where daytime power limited to 200 watts and nighttime power to 50 watts.

Novice frequencies: 3700-3750 kc., 26.96-27.23 Mc., A1 c.w. telegraphy; 145-147 Mc., radiotelegraphy or radiotelephony using any type of emission except pulse or type B (spark) emission.

Technician frequencies: All amateur privileges above 220 Mc.

- c) Call (your amateur call)
- d) File number (not required in the case of amateur applicants)
- e) Termination date of original license (i.e., the expiration date of the license you are renewing).

We point out again this new procedure applies

(Continued on page 155)

A Four-Purpose Communication-Receiver Auxiliary

Combining the C.W. Man's Reception Aids in One Unit

BY GEORGE D. HANCHETT, JR.,* W2YM, AND KENNETH G. BUCKLIN,* W2CDP

YEARS of DXing, particularly on 20 meters, can finally lead to a burst of ambition to build something which will make a real instrument out of that old receiver. Tempting QST articles on the one hand and QRM on the other sparked the ambitious burst, and a very useful four-purpose receiver auxiliary was built.

This auxiliary, intended primarily for c.w. operation, includes a 50-ke. Q5-er, an audio limiter, a peaked audio amplifier, and a crystal calibrator. A power supply having ample capacity is provided so that future gadgets could easily be added. Plenty of space is available for one particular gadget, a 15-meter crystal-controlled converter, which we plan to add when and if the band is available. A complete schematic diagram of the auxiliary is given in Fig. 1.

Auxiliary Components

Except for the coils, the Q5-er section of the auxiliary is not very different from many that have been described in the past. A 6SA7 is utilized as a converter, two 6SK7s as 50-ke. amplifiers, another 6SA7 as second detector, and a 6SN7-GT as b.f.o. A quick scan of the catalogs for suitable coils left us somewhat cold, since it

• Here's a spot where TV has proved useful to ham radio — by making available high-Q coils, at low prices, that can be used to make a really selective Q5-er. This article describes how to assemble them into 50-ke. i.f. transformers, how to build the i.f., and in addition describes some further "gimmicks" that help take the headaches out of fighting QRM.

looked as though many dollars might have to be spent to obtain commercial 50-ke. i.f. transformers. Our next thought was to try some of the existing r.f. choke coils but, as suspected, their Qs were much too low. Months went by with an eye toward the surplus market with no results, until, quite by accident, we hit upon the right idea. The coils utilized as the i.f. transformers were constructed from television horizontal-oscillator coils. This type of coil is used by more than 50 per cent of the TV manufacturers in what is known in the TV industry as a modified Potter oscillator circuit.¹

The coil is slug-tuned and in modern television sets is resonated with a 3900- μ fd. capacitor to produce the 15-ke. horizontal-oscillator frequency. It was discovered that if the coil is resonated with a 300- μ fd. capacitor, it tunes nicely through 50 ke. and has a Q of approximately 60. The i.f. transformers were constructed with two such coils mounted in a National HRO shield can as shown in Fig. 2.

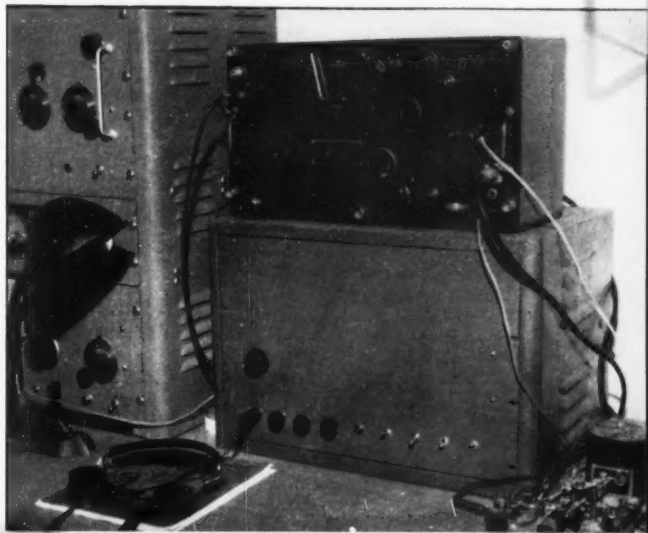
In order to provide more tuned circuits for added skirt selectivity, two such i.f. transformers

* % Tube Dept., Radio Corporation of America, Harrison, N. J.

¹ Following are the manufacturer's name and the model numbers for some of the television receivers using this type of coil:

Admiral — 20A1, 20B1, 21A1; Stewart-Warner — 9103B, 9103C, 9103E; Westinghouse — H-251, V-2150-82, V-2150-84; Tele-king — 510; Stromberg-Carlson — TC10, TC125, 317; National — NC-TV-10T; Meek — XM751, XT785; Starrett — M412 series; Garod — D1092, 1649; Sentinel — 407, 409.

The receiver auxiliary includes in one box four items for improving operating efficiency — a Q5-er, peaked audio circuit, audio limiter, and a 100-1000-ke. crystal calibrator. Power supply and an audio power output stage also are included.



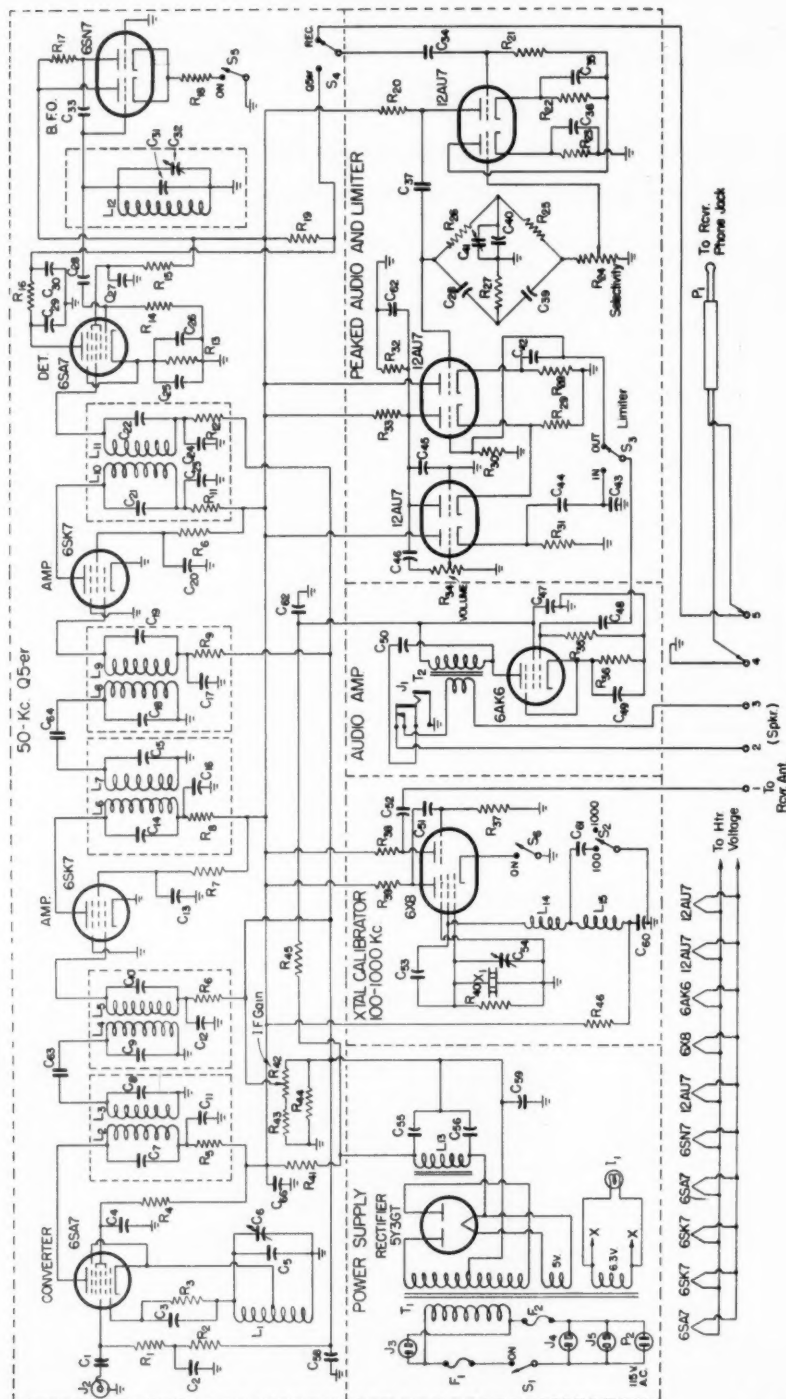


Fig. 1 — Circuit diagram of the four-purpose receiver auxiliary.

were coupled together by a 5- μ fd. mica capacitor for each of the two i.f. stages. A single transformer is used to couple the second 50-kc. i.f. transformer to the second 6SA7. Another TV horizontal-oscillator coil is used in the b.f.o. To make possible the use of this coil, a 6SN7-GT was selected so that a two-terminal oscillator could be em-

ployed, thus eliminating the need for a tickler winding or a tap on the coil.

Audio Section

The peaked audio amplifier is similar to the one described by one of the authors several years ago in *QST*.² The constants are modified so that the circuit will pass about 500 cycles. The audio limiter is similar to that described in *QST* by George Grammer, W1DF.³ Both audio limiter and peaked audio amplifier were designed to use 12AU7 miniature type tubes in order to minimize the physical size as well as to reduce the total heater drain. The output tube, a 6AK6, feeds both headphones and 'speaker.

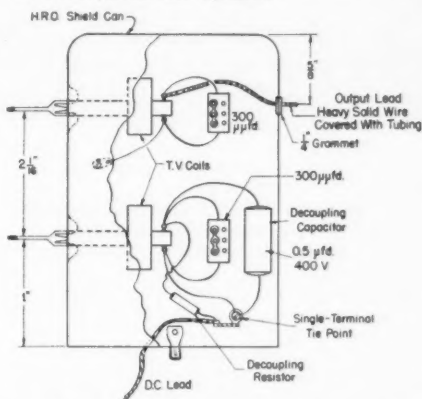


Fig. 2—Details of assembly of the i.f. transformer made from TV horizontal-oscillator coils.

Crystal-Calibrator Section

The crystal calibrator utilizes the new dual crystals for operation on 100 and 1000 kc. A 6 X 8, a miniature triode-pentode recently announced by RCA, is used as the crystal oscillator and harmonic amplifier, the pentode section being used as the oscillator and the triode section as the harmonic amplifier. The harmonic amplifier is merely an amplifier overdriven to help produce harmonics. As a matter of interest, it is possible to hear the 1-megacycle beats well up through the 14-Mc. band. In one location it even produced TVI on Channel 2.

Connection of the Q5-er to the communication receiver is accomplished through the use of a 6C4 cathode follower connected to the plate of the last i.f. amplifier of the receiver and fed to the 6SA7 by coax. This arrangement allows the auxiliary to be disconnected from the receiver at any time and does not impair the standard operation of the communication receiver in any way.

Construction

Construction of the auxiliary is not difficult

² Hanchett, "A Peaked Audio Amplifier for Communication Receivers," *QST*, Sept., 1948.

³ Grammer, "An Accessory for C.W. Reception," *QST* July, 1950.

- C₁, C₂₈, C₃₃, C₄₆, C₄₁ — 500- μ fd. mica.
- C₂, C₄, C₁₁, C₁₂, C₁₈, C₁₆, C₁₇, C₂₀, C₂₃, C₂₄, C₂₅, C₄₂, C₄₇, C₅₀, C₆₀, C₆₁, C₆₆ — 0.1- μ fd. paper, 400 volts.
- C₃ — 270- μ fd. mica.
- C₅, C₃₈, C₃₉ — 1000- μ fd. silver mica.
- C₆ — 75- μ fd. trimmer (APC type).
- C₇, C₈, C₉, C₁₀, C₁₄, C₁₅, C₁₈, C₁₉, C₂₁, C₂₂ — 300- μ fd. silver mica.

- C₂₆, C₃₅, C₃₈ — 25- μ fd. 25-volt electrolytic.
- C₂₇ — 0.5- μ fd. paper, 400 volts.
- C₂₉, C₃₀ — 0.005- μ fd. paper, 400 volts.
- C₃₁ — 270- μ fd. silver mica.
- C₃₂ — 75- μ fd. b.f.o. tuning (in b.f.o. osc. coil shield).
- C₃₄, C₃₇ — 0.01- μ fd. 400-volt paper.
- C₄₀ — 0.0015- μ fd. mica.

- C₄₁ — 0.001- μ fd. mica compression padder.
- C₄₃, C₄₈ — 0.25- μ fd. 400-volt paper.
- C₄₄, C₄₉ — 10- μ fd. 25-volt electrolytic.
- C₄₅ — 0.002- μ fd. mica.
- C₅₂ — 100- μ fd. mica.
- C₅₃ — 3- μ fd. mica.

- C₅₄ — 6-20- μ fd. trimmer.
- C₅₅, C₅₈, C₅₇ — 40- μ fd. electrolytic, 450 volts.
- C₅₈ — 16- μ fd. electrolytic, 150 volts.
- C₅₉ — 80- μ fd. electrolytic, 150 volts.
- C₆₂ — 8- μ fd. electrolytic, 350 volts.
- C₆₃, C₆₄ — 4.7- μ fd. mica.
- C₆₅ — 16- μ fd. electrolytic, 450 volts.

- R₁, R₂₈, R₂₉ — 10,000 ohms, $\frac{1}{2}$ watt.
- R₂ — 0.22 megohm, $\frac{1}{2}$ watt.
- R₃, R₁₄ — 20,000 ohms, $\frac{1}{2}$ watt.
- R₄, R₁₅ — 20,000 ohms, 1 watt.
- R₅, R₈, R₁₁, R₂₂, R₂₃ — 1200 ohms, $\frac{1}{2}$ watt.
- R₆, R₉, R₁₂ — 0.47 megohm, $\frac{1}{2}$ watt.
- R₇, R₁₀, R₃₅ — 0.1 megohm, $\frac{1}{2}$ watt.
- R₁₃ — 150 ohms, $\frac{1}{2}$ watt.
- R₁₆ — 33,000 ohms, 1 watt.
- R₁₇ — 68,000 ohms, $\frac{1}{2}$ watt.
- R₁₈ — 1500 ohms, $\frac{1}{2}$ watt.
- R₁₉ — 39,000 ohms, 1 watt.
- R₂₀, R₃₈ — 56,000 ohms, $\frac{1}{2}$ watt.
- R₂₁, R₃₀ — 1 megohm.
- R₂₄ — 2-megohm volume control.
- R₂₅, R₂₆, R₂₇ — 270,000 ohms, $\frac{1}{2}$ watt.
- R₂₇ — 150,000 ohms, $\frac{1}{2}$ watt.
- R₃₁ — 1500 ohms, $\frac{1}{2}$ watt.
- R₃₂ — 22,000 ohms, $\frac{1}{2}$ watt.
- R₃₃ — 47,000 ohms, $\frac{1}{2}$ watt.
- R₃₄ — 1-megohm volume control.
- R₃₆ — 900 ohms, 1 watt.
- R₃₉ — 0.3 megohm, $\frac{1}{2}$ watt.
- R₄₀ — 4.7 megohms, $\frac{1}{2}$ watt.
- R₄₁, R₄₅ — 1000 ohms, 10 watts.
- R₄₂ — 25,000-ohm volume control.
- R₄₃ — 2000 ohms, 1 watt.
- R₄₄ — 500 ohms, 1 watt.
- R₄₆ — 10,000 ohms, 1 watt.
- L₁ — B-c oscillator coil (Meissner 14-1033).
- L₂ — L₂, inc. — TV horizontal oscillator coil; 26 mh. (see text).

- L₁₃ — 8-hy. filter choke.
- L₁₄ — 0.5-mh. r.f.c.
- L₁₅ — 5.0-mh. r.f.c.
- F₁, F₂ — 3-amp. fuse and clip.
- J₁ — 6.3-volt pilot lamp and jewel.
- J₂ — Phone jack.
- J₃ — Coax connector, female.
- J₄, J₅ — A-c socket, female.
- P₁ — Phone plug.
- P₂ — A-c plug.
- T₁ — 360-0-360 v. at 120 ma.; 6.3 v. at 3.5 amp.; 5 v. at 2.0 amp.
- T₂ — Output transformer, 10,000 ohms to voice coil.
- X₁ — Dual crystal, 100 and 1000 kc. (Valpey type DFS).

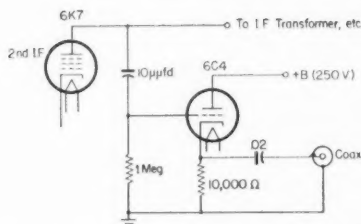


Fig. 3—Circuit of cathode follower installed in receiver. This is a permanent addition to the receiver and has no effect on its ordinary operation.

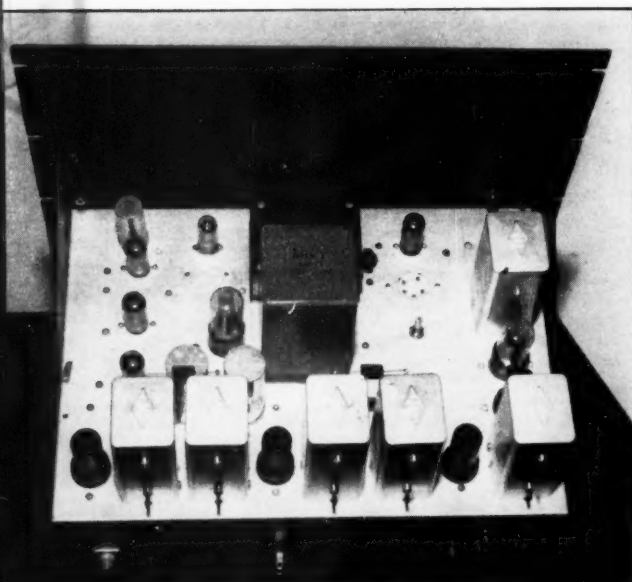
because no attempt was made to conserve space. A $12 \times 17 \times 4$ -inch aluminum chassis is secured by chassis mounting brackets to a $12\frac{1}{4} \times 19$ -inch relay rack panel, and is enclosed in a cabinet rack as shown in the photographs. The front panel has the following controls, from left to right:

- 1) 'Phone jack, with contact to connect 'speaker voice coil when 'phone plug is removed (J_1).
- 2) Audio volume control, with on-off switch for auxiliary and communication receiver ($R_{34}S_1$).
- 3) Selectivity potentiometer for peaked audio amplifier (R_{24}).
- 4) Bias control for 50-ke. i.f. amplifier gain (R_{42}).
- 5) Panel lamp (I_1).
- 6) Single-pole double-throw toggle switch to by-pass 50-ke. amplifier and connect receiver audio to auxiliary audio amplifier for 'phone reception (S_4).
- 7) Single-pole double-throw switch to cut out audio limiter for demonstration (S_3).
- 8) On-off switch for auxiliary b.f.o. cathode circuit (S_5).
- 9) On-off switch for crystal-calibrator (S_6).

The larger knob above and to the left of this row of controls is the b.f.o. tuning control (C_{32}). At the back of the chassis a barrier strip is used for connections to a 'speaker voice coil, the audio input from the communications receiver, and an output or antenna wire for the crystal calibrator. Three a.c. outlets are provided, one for a.c. to the receiver which is controlled at the front panel, and two for a desk lamp and electric clock. The final terminals are a socket for 117-volt a.c. input, and a coax fitting for coupling the receiver i.f. amplifier to the Q5-er. On the chassis alongside the 6X8 are a toggle switch for changing the frequency of the crystal from 100 to 1000 ke. and a shaft for tuning the capacitor which is used to zero beat the oscillator to WWV.

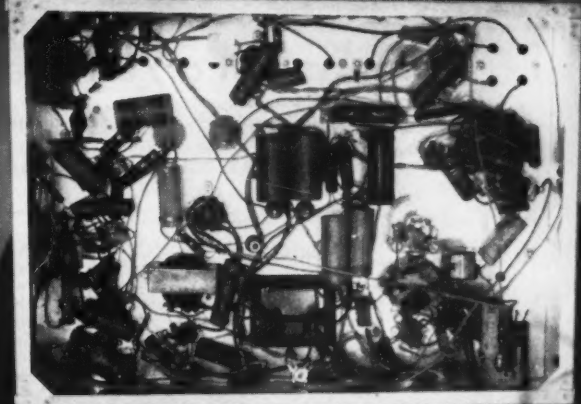
Alignment

Alignment of the receiver auxiliary is a comparatively simple process. After the wiring is carefully checked, voltages should be applied. With the aid of a receiver which covers the standard broadcast band, the local oscillator of the Q5-er should be adjusted to a frequency 50 ke. lower than the receiver intermediate frequency. This adjustment is made by listening on the broadcast band for the second and third harmonics. If these harmonics are separated by the desired frequency, then the oscillator is operating at the right frequency. After the adjustment is completed, the cathode follower of the auxiliary should be connected to the communication receiver by a length of coax cable. The communication receiver b.f.o. can be used for a signal generator. With the auxiliary b.f.o. off and the communication receiver b.f.o. on, the 50-ke. i.f.s should be aligned for maximum hiss output. The 50-ke. b.f.o. of the auxiliary is adjusted to frequency by beating it with the communication receiver b.f.o. The communication receiver b.f.o. should now be turned off and all trimmers



Chassis layout, showing the home-assembled 50-ke. i.f. transformers. The b.f.o. transformer is in the upper right in this picture. The 5-contact socket alongside it was originally intended for a crystal but was later replaced by a dual-crystal unit mounted on a sub-chassis.

Below-chassis wiring is not critical, since all circuits work at relatively low frequency. The air padder at the upper left in this view is the oscillator frequency adjustment (C_0) on the 6SA7 converter.



touched up for maximum performance on a weak signal. This completes the adjustment of the Q5-er.

Operation

The communication receiver used for our present installation is a BC-342J. Room was found for a 6C4 between the power supply and the front panel. One of the jacks marked "2nd audio" was changed to a coax fitting. The receiver is operated in normal manner, but with the b.f.o. turned off and the gain control held nearly at maximum. The auxiliary gain control is adjusted for normal operation at about two-thirds on by juggling it a bit as described in the July 1950 QST article² on audio clipping. The auxiliary b.f.o. can be changed slightly during operation, but maximum gain occurs close to one correct setting, and for marking this setting a pointer is recommended. The bias control for the 50-ke. amplifier serves as the principal gain control.

Performance

Actual measurements made with a BC-221 signal generator after alignment showed that the communication receiver i.f. was 468.6 kc., the Q5-er oscillator frequency 418 kc., and the i.f. amplifier frequency 50.6 kc. The 418 kc. was obtained with a 0.001- μ f. capacitor (C_5) and with the 75- μ f. trimmer (C_6) halfway in. It is very important to set the oscillator at the right frequency, because signals heard when the oscillator setting is incorrect can be very misleading.

Measurements have not been made on the selectivity, but the auxiliary is very impressive in operation. Only one sideband can be heard even on the strongest signal. It is a real pleasure to find that when a local signal suddenly bursts in, the limiter keeps the headphones from lifting you out of the chair. You can tune the local signal out completely in 4 or 5 kc. (provided the local rig doesn't have key clicks). Nevertheless, QRM being what it is, there will still be many times when you will want to run the receiver with the crystal filter all the way in and the peaked audio

amplifier at maximum. The effective separation is then 100 cycles or so. Even with such extremely sharp tuning, the combination is not a bit hard to handle; all the tuning is done by the vernier on the BC-342J (with backlash removed). With 'phone signals, of course, the speech is practically unintelligible, but being c.w. hounds, except for two meters, this doesn't worry us a bit.



25 Years Ago this month

April, 1927

... This issue carries available sections of the text of the long-sought "New Radio Law" which supersedes the antiquated Radio Act of 1912.

... Recent developments in dry electrolytic rectifiers are treated by Technical Editor Robert S. Kruse.

... "The Most Useful Meter" by R. F. Shea discusses the versatility of the vacuum-tube voltmeter for amateur applications.

... IBFA's article points out the similarities of radio laws and phenomena to the heat, light, mechanics and wave motion of ordinary physics.

... The CX340-UX240 high plate impedance triode is finding favor as a replacement for the 201-A.

... An overload relay announced by the Precise Mfg. Corp. of Rochester, N. Y., should save many dollars worth of equipment for the high-power enthusiast.

... A loss-reducing low-capacity 50-watt power tube socket has been made available by the Radio Engineering Labs of New York City.

... 9BAN describes a home-constructed bug key built at a cost of ten cents.

... 2EB's 5-meter test signals have been logged in Missouri and Kansas. IOA, 2CSM, 2XM and 9EHT are joining in the experiments.

... RCA's 15-meter commercial station 2XS, beamed on Argentina, is described and pictured in a feature article.

... Cameroons, Salvador, Abyssinia, Fanning Island and British Guiana are rare spots now reported on the amateur bands.

... The volume of DXing increasing manifold, C. C. Knight, saJB8, writes a timely piece on the accurate computation of global distances.

... 4JR of Gastonia, N. C., 6DCQ of Phoenix, Ariz., and 9DNG, Lawrence, Kans., are featured in descriptive write-ups.

Evolution of a 75-Meter Tunable Whip

A Novel Method of Loading-Coil Variation

BY WILLIAM H. FISHBACK,* W1IKU

LAST SPRING, our hopes of going mobile on 75 were brought to the boiling point by the acquisition of a 6-volt dynamotor. Having spent several hours getting the one-tuber to convert the car radio and obtain a reasonable facsimile of 75-meter 'phone signals, we felt ready to install the low-powered transmitter. Letting first things come first, cabling, control-head installation and other time-consuming details were completed. As anyone who has installed a strictly home-brewed control system and mounted a dynamotor in an engine compartment intended to house little more than the 1000-mile lube sticker can testify, time passed!

Up to this point only a vague idea of the antenna installation had been formed, and since the dummy lamp showed everything was perking, more or less, some thought was now given to antennas. So far, everything from transmitter to cabling had been scrounged either from the junk box or from sympathetic mobilers who were anxious to have more local QRM for reasons best understood by themselves. So when prices on antennas and loading coils were studied in the various amateur wish-books, it was very evident that somebody would have to start rolling his own smokes and switching to Pepsi-Cola, or else start looking for an out. The best possible prices in the ready-to-wear styles for what we wanted seemed to run between fifteen and twenty dollars, including the insulated mounting. We'd been reading surplus radio sections in the various flyers for so long we knew most of them by heart. In the end, we invested the grand sum of \$6.45 for a GI surplus mount, Type MP-132, at \$3.95 and five three-foot mast sections, MS-49, 50, 51, 52 and 53, at 50 cents each.

Constructing the bumper-bracket mount and assembling and mounting it on the car took only a short time. The bracket was purposely tilted back about 5 degrees from the vertical so that under practically all conditions the antenna would never swing forward over center with the resultant bumping noise when the mount spring turns close together. Also, with some rake, the antenna, when striking limbs, would not hit them squarely.

Either the MS-52 or 53 will fit the threaded hole in the MP-132 mast base; however, the MS-53 seemed unnecessarily heavy and was not used. First trials were made with mast sections MS-52, 51 and 50, and a series variometer inside the trunk with a short length of high-voltage wire (unshielded) to the tank coupling coil. This gave us a 9-foot whip with a convenient means of tuning. Initial results were very satisfactory, but

• The problem of keeping a good sliding contact on a mobile loading coil exposed to weather is not always easy to solve. In this article, W1IKU shows how the system can be tuned without the need for an electrical contact with the coil.

one good second look at the variometer showed that undoubtedly most of the power was probably still inside the trunk.

Although many satisfactory contacts were made, nobody sent us a bill for reshingling his roof except one of the local brethren whom we normally raise for a QSO by throwing open the south bedroom window and bellowing therefrom. So, after reading and listening to discussions on the relative merits of base, center and top loading, it was decided that center loading would probably provide the best electrical and mechanical answer to the loaded-whip problem. Getting the current loop out into the open where the radiation will be more effective by using a center-loaded whip may not be as good on paper as loading the top with inductance and capacitance, but it represents the happy medium. After all, we were interested in the mobile radio angle and not in pruning tree limbs or mobile whips!

Matching threads on the available loading coils with those on the mast sections called for having adapters made. Have you priced machine-lathe work lately? — we have. We had acquired some 1½-inch polystyrene tubing previously, against the day we might want to make our own loading coils. This tubing comes in 12-inch lengths, 1½-inch o.d., with approximately ⅜-inch wall selling surplus for \$1.25 and at this writing is still available. End plugs for the tubing were made from 1½-inch brass shaft, each being 1 inch long and drilled with a ¼-inch and a ⅜-inch drill, respectively, in a lathe to provide true alignment of the antenna assembly.

The ¼-inch drilled plug (actually a 0.010-inch oversized drill was used) was sweat-fitted to one end of the MS-50 section after the bottom fitting had been sawed off. The ⅜-inch drilled plug was fitted to the MS-52 section. These mast sections are copper-clad and the ends should be cleaned with steel wool (sandpaper is apt to take off too much copper) to insure a good soldered connection. The plugs were then soldered to their mast sections and then drive-fitted into the tubing. One word of caution, however: If the fit is apparently rather tight, it might be best to remove some of the inside of the tubing with a sharp knife and sandpaper, since polystyrene

* Box 504, Chatham, Mass.

fractures easily. Although our first attempt at a drive fit was successful, albeit a little brutal, the tubing is still whole but shows discoloration due to the stress. This seems to be normal with polystyrene, but better to play it safe. It might possibly be better to have a loose fit and pin with machine screws rather than attempt a drive fit. However, a good fit precludes any possibility of condensed moisture inside the coil itself. After assembling the tubing and mast sections an 8-32 hole was drilled and tapped in each end for electrical connection.

Estimating the number of turns from general practice (70-100 microhenrys, depending on the installation and frequency) 10 inches (about 130 turns) of No. 14 enamel wire was then close-wound on the coil form and fastened with 8-32 screws.

Pruning the coil was simpler than anticipated. A razor blade was jammed into the end of a 3-foot dowel and one end of a short flexible test lead was fastened to the blade, the other end being fastened to one of the 8-32 screw heads. Firing up the transmitter, no loading showed on the plate meter, but by moving the blade up and down the coil, the resonant point was quickly and accurately found. Allowing two or three turns for error, the excess turns were removed and the last seven or eight turns on each end spaced to give exact resonance. One important point, however — prune the coil for the lowest frequency anticipated. It is far easier to remove than to add turns later.

Even after resonance had been established, we were not certain that we had the coil properly pruned, so the transmitter was moved to a higher frequency and a shorting ring slipped over the coil, held in place with masking tape. It was found that exact resonance could be easily obtained for any given frequency by the position of the shorting ring. This led to the development of a permanently-attached ring which could be moved and fixed in place, as shown in Fig. 1.

The effect of the shorting ring increases rapidly as it is moved toward the center of the coil, the effect being somewhat less near the end. Spacing the turns at the end of the coil will provide an acceptable means of varying the inductance gradually. There are probably several more satisfactory means of adjusting the position of the ring, but the one shown is the result of a deliberation of only a few minutes. With it, a variation of 100 kc. or more in the 75-meter 'phone band is obtained. Ours covers 4000-3900 kc. quite handily.

The ring has one advantage not to be overlooked in that the inside of the coil can be made watertight with no concern for condensation changing the value of the inductance. Wet-weather troubles were reduced to a minimum by liberal application of polystyrene dope to the outside of the coil. Since the tubing has some flexibility, the dope will eventually crack, admitting moisture between turns and more dope must be applied. However, the ring will take care of most any detuning caused by wet weather.

The effect of the ring is, of course, to reduce the inductance as it is moved toward the center of the coil. The Q will be reduced as the ring changes the resonant frequency higher in the band since the resistance of the total coil remains the same but the inductance is reduced. However, signal reports indicate that no noticeable difference exists between the two limits of adjustment. There is no contact resistance problem since the ring is insulated from the coil, and no concern is necessary over any sliding contacts as in the case of shorting taps or contact fingers.

Perhaps the wet-weather problem could be more effectively handled by the liberal application of some compound such as Amphenol Sili-

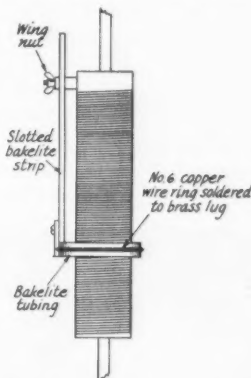


Fig. 1 — Sketch showing the essentials of the sliding-ring device for varying the loading-coil inductance of a 75-meter mobile whip.

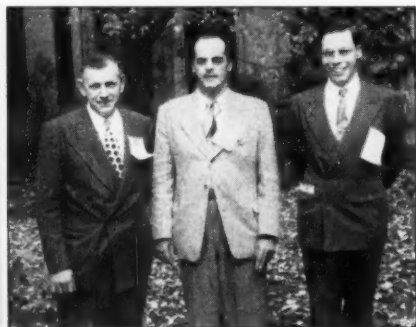
cone, but unless the compound can be forced between turns it is doubtful this is the answer. What really is needed is a plastic shield with an incorporated ring to slip over the coil and be made movable up and down to change the ring-coil relationship.

A tremendous improvement over the internal loading scheme first tried has been verified many times. We still haven't worked the West Coast with our 20-watt mobile, nor have we had umpteen 20-db.-over-S9 reports from umpteen generous hams with expanding 8-meters, but we hold our own. No field-strength curves have been plotted nor any roofs reshingled, but our antenna really works. Optimum variation of transmitter frequency without readjusting the ring is about plus or minus 10 kc. which would indicate the Q of the coil to be fairly good.

The total cost for our 9-foot whip? The sum of \$8.59 took care of the whole business including 75 cents for drilling the plugs in a lathe, 65 cents for the polystyrene dope, plus the No. 12 wire. This is considerably less than buying a ready-to-go antenna assembly, but, of course, the labor involved amounts to something. However, what ham counts his labor when the final result gives him all he wants, plus the satisfaction of doing it himself.

On the Air with SINGLE SIDE BAND

PRACTICALLY all of the fellows we talked to about converting this column into a s.s.b. hints-and-kinks department were in favor of it, so that's what we'll be shooting for from now on. Not that we plan to neglect any of the records or other newsworthy events but, as **W3ASW** puts it, "... It's tough to turn out new and startling happenings month after month just to get in the column." So please let us hear from you either on your activity or on any technical tips you may have run across. And they don't have to be terrific and monumental developments (although those aren't being discouraged!) — any practical hints that will help a guy get on with s.s.b. or make his rig a little better are most welcome.



Here are three members of the Chicago s.s.b. gang you should know. **W9SQE** (left) and **W9FHS** (center) have been running the stuff on 160, and **W9DYV** (right) is marketing a phasing-type exciter.

Yoe, **W2EB**, says that **ZS6KD** is being needed every few days to get his **W1JEO** rig on the air. The **ZS** still lacks a few parts, but **W2EWL** is helping him out on that score.

Nick of **W4MXL** adds a little more about **W4MKT**, the 15-year-old single-sidebander we told you about last month. Seems that Paul has the misfortune to have been confined to bed or a wheel chair all of his life, but he is now going to school (via a remote telephone speaker system) and getting excellent grades, thanks to his amateur radio experience. His s.s.b. rig is a phasing job, running 300 watts to a 304TL, which he built himself after gaining experience by building a.m. rigs for all bands from 2 to 75. **W4MXL** adds to the low-power tales of s.s.b. by telling about the time he fed a 6AK6 Class A into a 75-ohm line to the antenna and developed all of 5.5 volts (400 milliwatts). But it was enough to be

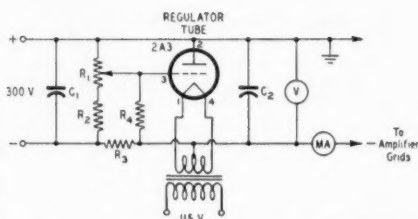


Fig. 1 — The regulator circuit used at **W3MBY** for stabilizing the bias voltage on a linear amplifier. The bias voltage can be adjusted by varying R_1 .

- C_1 — Power-supply output condenser.
- C_2 — 50- μ fd. electrolytic, 150 volts.
- R_1 — 10,000-ohm potentiometer.
- R_2 — 56,000 ohms.
- R_3 — 35,000 ohms, 5 watts.
- R_4 — 0.22 megohm.

heard in Michigan, Pennsylvania, New York, New Jersey and Massachusetts!

One of the requisites of any linear Class AB₂ or Class B amplifier (except those using zero-bias tubes like the 811-A) is a "stiff" bias source. Although batteries are used in many instances, they are really at their best only when the peak grid current is relatively low. Dave Mann, **W3MBY**, worked out a variation of an earlier regulator circuit that he uses to give a constant 40 volts of bias, over a grid current range of 0 to 80 ma. As shown in Fig. 1, the circuit has another advantage in that a 1000-ohms-per-volt grid voltmeter can be hung across the regulator without affecting its operation.

Ben Grady, **W2SNQ**, has found the circuit of Fig. 2 to be a reliable and noncritical one for heterodyning an s.s.b. signal from one frequency to another. The values shown have been used with crystals in the 4- to 7-Mc. range.

A lot of the s.s.b. gang have been caught at one time or another by amplified thermal noise in their transmitters "jamming" the signal or

(Continued on page 127)

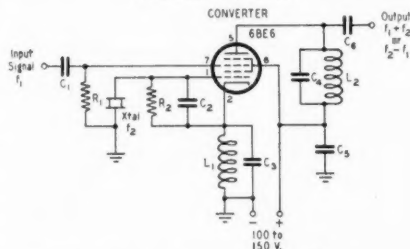


Fig. 2 — The simple crystal-controlled converter circuit used by **W2SNQ**.

- C_1, C_6 — Coupling condenser, 0.01 to 0.001 μ fd.
- C_2 — 47 μ fd.
- C_3 — 100 μ fd.
- C_4 — Output tuning condenser.
- C_5 — 0.001 μ fd.
- L_1 — 0.5 mh.
- L_2 — Resonates with C_4 to desired output frequency.
- XTAL — 5 Mc.

With other crystals, L_1 , C_2 and C_3 should be selected to give approximately 15,000, 600 and 300 ohms reactance respectively at the crystal frequency.

A Compact Portable 2-Meter Emergency Station

Mass-Production Methods by the Livingston Radio Club Provide Effective Civil Defense Communication

BY ROBERT W. EHRLICH,* W2NJR, RICHARD P. WELLS,** W2ORX, AND RALPH H. PRESTON,*** W2BWN

RECENTLY, many groups of radio amateurs throughout the nation have been called upon to set up communication systems for use in civil emergencies. The Livingston Radio Club was no exception. As the first step in the development of a working communications network, the club undertook production of the portable transmitter-receiver units described in this article. It is felt that the features of this equipment may offer worthwhile ideas to groups contemplating similar projects.

Civil defense starts at the community level, and it appeared that two meters was the logical band on which to establish an intratown network. A survey disclosed that there was plenty of two-meter equipment among the club members as well as in neighboring towns, but it consisted of assorted individual rigs which were not constantly available and lacked uniformity in construction, servicing methods or operation. Consequently, it was decided to start from scratch and build units designed to meet the following objectives:

1) Similarity in construction and operation, and subassembly design, for maximum availability of complete units in case of failure of any part.

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** 72 W. Hobart Gap Road, Livingston, N. J.

*** 3 Mitchell Ave., Roseland, N. J.

2) Small size and adaptability to installation in a car, at a field site or in a building.

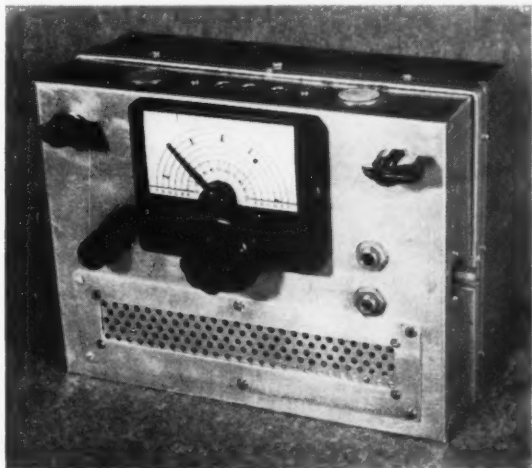
3) The transmitter should be crystal-controlled and have sufficient power for reliable service over several miles.

4) The receiver should be nonradiating with good sensitivity and rather broad selectivity. Receiver output to be adaptable to headphones or 'speaker.

5) Battery drain to be as low as feasible.

Each member contributed his specialized resources to the whole job. Electrical design problems were turned over to a committee consisting of W2NJR and W2ORX. Mechanical layout was designed by Ralph Preston, W2BWN. Other members handled portions of the production job: one man drilled and bent all the subchassis, another did production testing, and several others handled the purchasing of parts. The one item not handled on a group basis was actual wiring, the thought being that each constructor should have a full knowledge of what went into his own set. While a unit of this type is not normally considered to be the sort of project a beginner should tackle, the pooling of the skills and facilities of the club members made it possible for everyone, including those who only recently obtained their Novice tickets, to complete their equipment successfully.

Front view of one of the Livingston Radio Club's 2-meter emergency stations. Note that the cabinet is made of two standard chassis, bottom to bottom.



General Description

The completed station is a single unit, which needs only the connection of power, antenna, speaker and microphone to go on the air. As shown in the photographs, it consists of three basic subassemblies: receiver r.f. and detector section, transmitter r.f. section, and audio and control section. The last is in continuous operation either as an audio amplifier or modulator. The control circuit performs all switching functions.

The three subassemblies are constructed on strips about 2 by 9 inches in size. These are drilled with templates to insure interchangeability. They are mounted in a standard $7 \times 9 \times 2$ -inch chassis which serves as the front panel. A similar chassis forms the rear cover. The audio and control subassembly is more or less permanently attached to the front-panel chassis, but the transmitter and receiver sections can be removed and replaced in a few minutes.

Operating controls include receiver volume, regeneration and tuning controls, and a three-position transmit-receive switch. The center position is for transmit, and the two sides for reception by headphones or by speaker. A switch on the volume control can actuate a relay in the power supply to turn the unit on, and another on the regeneration control drops the plate voltage on the transmitter for tune-up purposes. Adjustments are made by connecting an external meter in the transmitter test jack, which is accessible by removing the front grill.

Plenty of ventilation was found to be necessary, particularly in the front and top. The life of tubes and components can be seriously impaired without it.

Audio and Control Section

The audio and control section includes a two-stage audio system used as a modulator in transmitting and as an audio amplifier in receiving, and a multisection transmit-receive switch which performs the following functions:

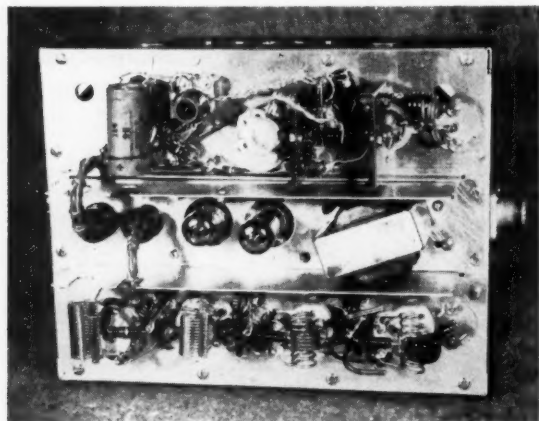
- 1) Switches B-plus between receiver and transmitter.
- 2) Switches the input of the audio amplifier between receiver and microphone.
- 3) Connects or disconnects the modulation output winding and the final.
- 4) Connects the high- or low-impedance audio output winding to the 'phone jack, or opens this winding entirely for transmit.
- 5) Cuts a dropping resistor in the B-plus lead for receive or shorts it out for transmit.
- 6) Switches the antenna between receiver and transmitter.

Volume and regeneration controls are also part of the audio and control section.

As an audio amplifier stage is necessary for receiving operation, it was possible to eliminate the usual microphone transformer and utilize this amplifier stage in the transmitting circuit to furnish the necessary voltage step-up from microphone to 6AQ5 grid. Microphone current is derived from the 6AQ5 cathode, suitably by-passed. If Pins 2 and 7 are connected together, the receiver first stage will accommodate almost any of the popular miniature pentodes, as indicated in Fig. 1.

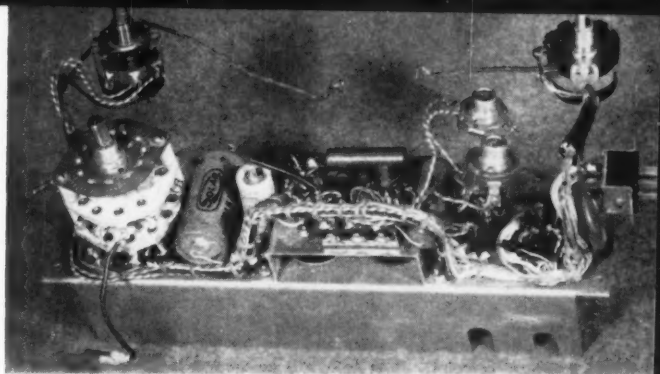
The only critical feature, mechanically, is to locate the ceramic transmit-receive switch so that it will fit properly through the hole in the front panel. Two tapped bushings are used to mount this switch to the chassis, and these must be of just the right height so that the front of the switch will just clear the front panel.

Since most of the leads carry d.c., their location is not critical. Shielded wire should be used on the audio leads from the receiver output to the volume control, thence to the transmit-receive switch and to the grid of the first audio tube. Reserve one of the sections of the switch nearest the front panel and close to the coaxial antenna connector for antenna switching. There appears to be no necessity for using coaxial antenna leads to and from the switch; ordinary hook-up wire with ground return through the chassis seems perfectly satisfactory.



Interior of the 2-meter portable transmitter-receiver described by W2NJR, W2ORN and W2BWN. The three portions of the station are constructed as subassemblies, and then screwed to the bottom of the chassis that comprises the front portion of the cabinet. The audio and control unit is the center strip, with the receiver above and the transmitter below.

The audio and control unit of the 2-meter portable station. Wiring is complete except for two connections that are made after the assembly is mounted in place.



With two exceptions, all plugs, jacks and controls can be wired on the subchassis before it is inserted in the main front chassis. The two parts that are most easily wired after the unit is in place are the test resistor, which mounts inside the top of the front chassis; and the antenna output connector, which requires one short lead over to the transmit-receive switch.

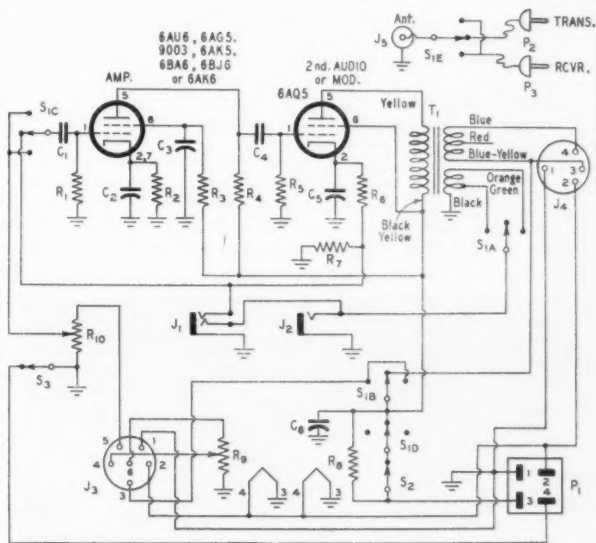
Checks can be made on the audio and control system without having the transmitter or receiver available. For audio tests, the load can be simulated by a 10-watt 10,000-ohm resistor between the blue lead on the output transformer and ground. Connect an a.c. voltmeter, through a condenser, across the resistor. With the control switch at "transmit" it should be possible to talk up to about 150 volts a.c. with a supply voltage of about 200 volts. Then with the control switch on "receive" (and no 'speaker or 'phones) observe the voltmeter for signs of oscillation as the volume control is adjusted. If any oscillation occurs, it can usually be cured by a 0.001- μ f. condenser between the first audio grid and ground. In stubborn cases, a second condenser may be tried from the 6AQ5 grid to ground. It is desirable to make continuity checks of the control portions of the circuit to make sure that the test resistor and regeneration control are wired properly.

Receiver

Several receiver prototypes were tried before the final design was established. The receiver is of the superhet-superregenerative type for good performance with few tubes. The standard superheterodyne "front end" uses an r.f. pentode amplifier and a dual triode mixer-oscillator. The tube types indicated are the ones used in the production models but various types of high-frequency pentodes and twin triodes with individual cathodes may be used,

Fig. 1 — Schematic diagram of the audio and control unit. Pins 2 and 7 should be connected together for tube selection given for first stage.

- C_1, C_4 — 0.005 μ f.
 C_2, C_3 — 5- μ f. 50-volt electrolytic. C_3 — 0.05 μ f.
 C_6 — 8- μ f. 450-volt electrolytic.
 R_1, R_3, R_5 — 0.47 megohm, $\frac{1}{2}$ watt.
 R_2 — 1000 ohms, $\frac{1}{2}$ watt.
 R_4 — 0.22 megohm, $\frac{1}{2}$ watt.
 R_6 — 220 ohms, 1 watt.
 R_7 — 470 ohms, 1 watt.
 R_8 — 5000 ohms, 10 watts.
 R_9 — 50,000-ohm potentiometer with switch.
 R_{10} — 0.5-megohm potentiometer with switch.
 J_1 — Microphone jack, non-shorting, to fit PL-68 plug.
 J_2 — Phone jack, non-shorting, to fit PL-55 plug.
 J_3 — Transmitter power socket, 6-pin (Amphenol 78-S6S).
 J_4 — Receiver power socket, 4-pin (Amphenol 78-S4S).
 J_5 — Coaxial socket (Amphenol 83-1R).
 P_1 — Power plug, 4-pin (Jones P-304AB).
 P_2, P_3 — Plugs for antenna connection (RCA phono fitting).
 S_{1A}, B, C, D, E — 2-section ceramic switch, 5 circuits, 3 positions.
Each section shown in transmit position.
 S_2 — Switch on R_9 . S_3 — Switch on R_{10} .
 T_1 — Combination modulation and output transformer (Ease No. 9D1003).



if the sockets are wired accordingly. The 6AK5, 6BA6, 6AU6 and 6AG5 are suitable for use in the r.f. circuit while the 12AU7, 12AT7, 12AX7, 6BQ7, 6BK7 and 2C51 (W.E. 396A) work well in the mixer-oscillator position. Coupling between the mixer plate and detector grid is a one-turn link loosely coupled to the cold end of each coil. The two coils are separated by several inches, to limit the coupling to that through the link path only. Oscillator injection is obtained through a one-turn link between the oscillator and mixed grid coils.

The detector is a conventional superregenerative type using a pentode tube, with regeneration controlled by varying the screen voltage. The tubes recommended for use in the r.f. amplifier are applicable in the detector as well. The detector grid circuit is tuned to the same frequency as the mixer plate circuit, about 18 Mc.

The receiver is built on a $2\frac{1}{2} \times 9$ -inch subchassis. To avoid congestion around the tube sockets, use of the smallest available components is recommended. Of the tube socket shields, shown in the photograph, the one across the r.f. amplifier is essential for proper performance. This should pass between Pins 1 and 7 and Pins 3 and 4. The shield on the mixer-oscillator is not necessary for electrical reasons, but it provides a convenient mounting and grounding point for the oscillator and mixer circuit elements.

Note that the r.f. plate and mixer grid coils should be mounted with the B-plus and ground ends toward each other. The mixer plate coil form is mounted directly to the chassis, but the detector grid coil form is glued in the circular recess in its trimmer condenser and the latter is mounted on the chassis with two stand-off bushings. In some later models this coil and condenser were mounted on an angle bracket to enable adjustments to be made from the top of the set without removing the receiver subchassis.

It is suggested that the builder beg, borrow or steal a grid-dip meter for aligning the receiver. Although adjustments may be made on a received signal there are variables which make initial adjustment in this manner rather difficult.

The tuning of the r.f. plate and mixer grid circuits is not varied with the local oscillator, so the bandwidth of this coupling circuit must include the whole two-meter band. Each coil is pre-adjusted by a grid-dip meter to resonate at 146

Mc. by itself, with the other coil detuned. When the two coils are placed close together and in line, the bandwidth will be about right.

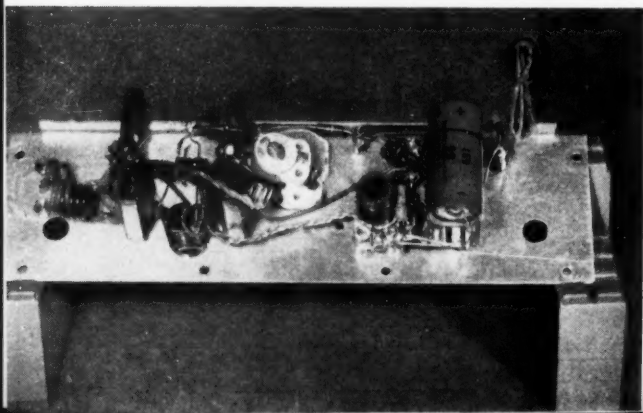
The two i.f. coils are adjusted according to the same principle. First, with the link pulled away from one coil so that coupling is negligible, the detector grid coil is tuned to match the resonant frequency of the mixer plate coil. Then the coupling is increased just to the point where some broadening of the combined response (measured at either coil) is apparent.

Continuing with the grid dipper, the oscillator is made to resonate in the 120-130-Mc. range by means of its trimmer. The oscillator injection coupling link cannot be set by the grid-dip oscillator, so at first it may simply be placed so that the one turn at each end is closely linked to the grounded end of the mixer grid and oscillator coils.

When voltage is first applied, check to determine whether or not the r.f. amplifier is oscillating. An absorption-type wavemeter will provide sufficient indication for this test, or the plate current to the stage may be checked for any sign of variation. Be sure that the grid circuit of the amplifier is loaded. A dummy antenna consisting of a resistor equal to the antenna line impedance will do. Should the circuit show a tendency to oscillate try removing the by-pass condenser from Pin 7 of the 6AK5. (The circuit should be wired with a by-pass and 150-ohm resistor on Pin 2 and a by-pass on Pin 7.)

Tests have indicated that little or no quench-frequency filter is required in the detector plate circuit. However, should the builder desire to install such a device, a 2.5-mh. r.f. choke bypassed at both ends with 0.002- μ f. works very well.

The receiver is now ready to tune for signals. It should perform well enough for general purposes with no adjustments other than those outlined above. If the builder desires, however, improved performance may be obtained in some cases by listening to weak signals and making careful adjustments of the oscillator injection link, the i.f. coupling link and the detector grid tuning. Best sensitivity occurs when the detector is loaded so that it requires about 30 volts on the screen to begin regeneration, the required loading being obtained by increasing the i.f. coupling gradually and retuning the detector grid coil carefully.



Receiver subassembly of the Livingston portable. The r.f. end is at the left.

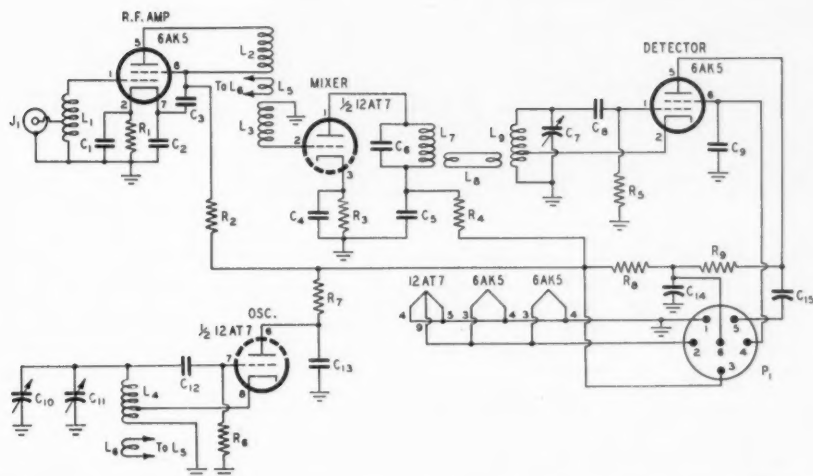


Fig. 2—Schematic diagram of the receiver portion of the 2-meter portable station.

C₁, C₂, C₃, C₄, C₁₃—0.0005- μ fd. disk ceramic.

C₅, C₉—0.0015- μ fd. mica.

C₆, C₈, C₁₂—22- μ fd. ceramic.

C₇, C₁₁—7-45 μ fd. ceramic trimmer.

C₁₀—Shaft-type APC trimmer, 1 stator and 1 rotor plate.

C₁₄—8- μ fd. 450-volt electrolytic.

C₁₅—0.01- μ fd. paper tubular.

R₁—150 ohms, $\frac{1}{2}$ watt.

R₂—3300 ohms, $\frac{1}{2}$ watt.

R₃, R₄, R₇—1000 ohms, $\frac{1}{2}$ watt.

R₅—1 megohm, $\frac{1}{2}$ watt.

R₆—22,000 ohms, $\frac{1}{2}$ watt.

R₈—50,000 ohms, $\frac{1}{2}$ watt.

R₉—0.1 megohm, $\frac{1}{2}$ watt.

L₁—4 $\frac{1}{2}$ turns No. 14, $\frac{3}{8}$ -inch diam., $\frac{3}{8}$ inch long, tapped at 1 $\frac{1}{2}$ turns.

L₂—8 $\frac{1}{2}$ turns No. 18, $\frac{1}{4}$ -inch diam., $\frac{3}{8}$ inch long.

L₃—6 $\frac{1}{2}$ turns No. 18, $\frac{1}{4}$ -inch diam., $\frac{5}{16}$ inch long. L₂ and L₃ are mounted in line, $\frac{3}{16}$ inch apart, with cold ends nearest each other.

L₄—3 turns No. 18, $\frac{5}{16}$ -inch diam., $\frac{1}{4}$ inch long, tapped 1 turn above ground.

L₅, L₆—Coupling link between cold ends of L₃ and L₄, 1 turn at each end, coils and link of pushback.

L₇—21 t. No. 22 e., $\frac{1}{4}$ -inch diam., close-wound.

L₈—Same as L₇, but with tap 4 turns from cold end.

L₉—Coupling link between L₇ and L₈, 1 turn pushback at cold ends. Position L₇ and L₉ so that coupling is through link only.

J₁—Antenna fitting (RCA phono fitting).

P₁—6-pin miniature plug (Amphenol 71-6S).

Tests with many receivers of this type have indicated an ultimate sensitivity equal to, and sometimes better than, an SCR-522 with a rebuilt front end.

Transmitter

The transmitter circuit has been adequately described in previous *QST* articles.¹ The first half of the first 6J6 operates as a 24-Mc. overtone oscillator, and the second half doubles to 48 Mc. The second 6J6 is a push-pull tripler to 144 Mc., and the third operates as a neutralized push-pull amplifier at the output frequency.

Most 8-Mc. crystals will operate successfully at the third overtone, but it should be kept in mind that the resultant frequency may not be exactly three times the frequency marked on the crystal. If a 24-Mc. crystal is available, it can be expected to produce somewhat greater output and at its designated frequency.

Final neutralization is done with two pieces of 75-ohm Twin-Lead, cut as required for proper capacity. This arrangement has the drawback of requiring some selection of tubes for the final, because different 6J6s vary considerably in capacitance. Fixed neutralization was selected, how-

ever, because it is much easier to install the Twin-Lead than any variable condensers, and because it was found that by selection procedures outlined later it is usually possible to find several tubes that will function properly in the same socket without reneutralization.

The three split-stator variable condensers are made by modifying ordinary single-section "APC" trimmers obtainable on the surplus market. With a fine coping saw or jeweler's saw cut half the stator plates free from one of the stator support rods. Cut the small portion of the stator plates where they attach to the supports. Then cut the remaining stator plates free from the other support rod. The plates should be cut from each side in sequence, so that if there are six plates, for example, plates 1, 2 and 3 will be cut from one rod and plates 4, 5 and 6 from the other. If there is an odd number of stator plates, remove the center one entirely. Clean out all burrs and excess metal, and sight through to make sure no plates touch as the rotor is turned. Make sure that the manufacturer has not strapped the support rods together, as these rods are now separate terminals. Finally, make a ground connection from the rotor contact spring to one of the two metal mounting blocks.

The modified condenser requires some care to

¹ Tilton, "A Two-Meter Station for the Novice," *QST*, March, 1950.

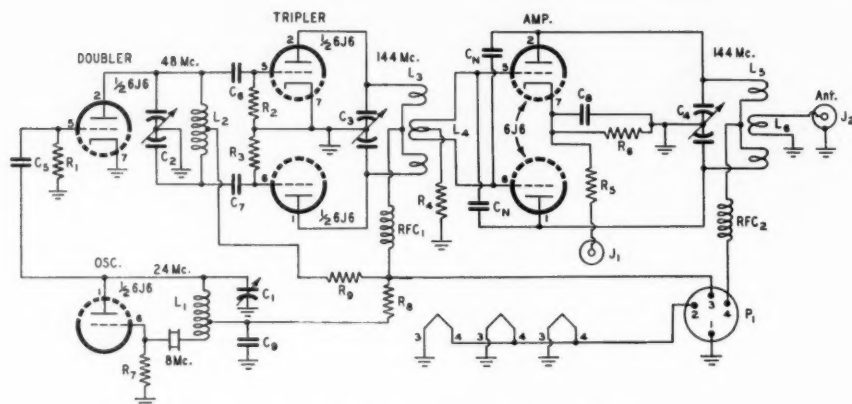


Fig. 3—Schematic diagram of the transmitter portion of the portable station.

C₁—50- μ fd. padder, APC type.

C₂—Similar to C₁, but modified for split stator—see text.

C₃, C₄—25- μ fd. APC-type padder, modified for split stator, as above.

C₅—47- μ fd. ceramic.

C₆, C₇—27- μ fd. ceramic.

C₈, C₉—0.005- μ fd. disk ceramic.

C₁₁—Neutralizing capacitors of 75-ohm Twin-Lead—see text.

R₁—47,000 ohms, $\frac{1}{2}$ watt.

R₂, R₃—33,000 ohms, $\frac{1}{2}$ watt.

R₄—1500 ohms, $\frac{1}{2}$ watt.

R₅—5000 ohms, \pm 5 per cent, $\frac{1}{2}$ watt.

R₆—100 ohms, \pm 5 per cent, $\frac{1}{2}$ watt.

R₇—3300 ohms, $\frac{1}{2}$ watt.

R₈—5600 ohms, 1 watt.

R₉—4700 ohms, 1 watt.

L₁—18 turns No. 20, $\frac{1}{2}$ -inch diam., $1\frac{1}{8}$ inch long, tapped 4 turns from crystal end (B & W Mini-inductor No. 3003).

L₂—13 turns No. 20, $\frac{1}{2}$ -inch diam., $\frac{3}{4}$ inch long, center-tapped (B & W Mini-inductor No. 3003).

L₃, L₅—6 turns No. 14, $\frac{3}{8}$ -inch diam., 1 inch long, $\frac{3}{8}$ -inch space in center, center-tapped.

L₄—4 turns No. 20 push-back, $\frac{3}{8}$ -inch diam., close-wound, center-tapped.

L₆—3 turns No. 20 push-back, $\frac{3}{8}$ -inch diam., close-wound.

J₁—Test-point pin jack.

J₂—Output fitting (RCA phono jack).

P₁—4-pin miniature plug (Amphenol 71-4S).

RFC₁, RFC₂—Single-layer r.f. choke (Ohmite Z-144).

avoid overheating when soldering the coil to the support rods, else the stator plates will come loose. They stand up well under use, however, and are considerably less expensive than the commercial split-stator condensers. If the latter are desired, E. F. Johnson types 11MB11 and 9MB11 may be used in place of the split APC-50 and APC-25, respectively.

Sockets should mount under the chassis to insure clearance for the tips of the tubes. A solder lug is fastened under each socket nut to facilitate grounding the heaters and cathodes, and a small insulated terminal post is mounted on the center collar of each tube socket for terminating the B-plus leads and the ends of the dropping resistors and chokes for each stage. Coupling condensers are of the tubular ceramic "dog-bone" type, and by-pass condensers are disk ceramics.

The line-up job falls into two parts: the production alignment when the unit is first completed, and the final tuning that is done whenever the frequency is changed or a new antenna is used.

When a number of units are being constructed, it is desirable to set one man up to do the production alignment on all units as they are finished. He should, if possible, be equipped with a good grid-dip oscillator, not only to set the coils on frequency in the first place but also to use as a detector for observing progress of the signal. A 0-100 microammeter is also helpful, as well as the 0-1 milliammeter which will be used later

on for final adjustments. Lacking this equipment, it is possible, with some care, to do the job with an ordinary multimeter by measuring plate currents of the individual stages.

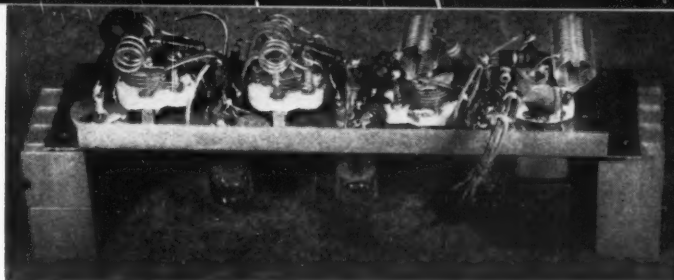
The first alignment step is to adjust the first three stages for maximum grid current in the final. This is done with the final plate lead disconnected and with not over 150 volts on the remaining plates. The final grid current is measured with a sensitive meter connected to the test jack and chassis, and a reading of about 50 microamperes should be obtainable with about 120 volts on the exciter stages. The following points should be kept in mind:

- 1) There may be quite a difference in feedback requirements of various 8-Mc. crystals, so try several others if the first doesn't work.

- 2) The oscillator condenser must be set on the low-capacity side of resonance for stable operation. Tune from high to low capacity until oscillation starts, then go a little farther. Check for proper adjustment by applying plate voltage intermittently to see if oscillations start readily. Adjust the position of the tap only if necessary to insure easy starting but no self-oscillation. Recheck the oscillator tuning after the doubler has been tuned.

- 3) No final grid-current reading will be obtained until all circuits are pretty well in line. Meanwhile, a sensitive wavemeter can be used to detect the desired signals, or the stages can be

Transmitter portion of the 2-meter station.



tuned by watching for slight dips in plate current. The usual pilot bulb and loop is not sensitive enough when the unit is working at low voltages.

4) When some final grid-current reading is obtained, repeak all stages and adjust the coupling to the final grid (retune the tripler plate each time coupling is changed) to get the greatest reading. The final plate should be completely out of resonance when taking this reading.

The next step is neutralization and selection of suitable tubes for the final. Start with about 1 3/4 inches of Twin-Lead on each side, exclusive of the length that is separated for connection to the tube pins. Tune the final condenser and note the drop in grid current as the final goes through resonance. At first the dip may be 90 per cent of the original total grid current. Snip off about 1/8 inch from each capacitor and reresonate the final plate condenser, continuing until the dip in grid current is only about 10 per cent of the total grid current.

At this point it is desirable to select tubes for the final. Try all the 6J6 tubes available in the final socket, noting how much the grid current dips for each one. If there are two or more that show almost identical performance, reserve these for use as regular and spare in the final. If no two act alike, select one in about the middle of the range observed, remembering that it may be necessary to rerenutralize if the tube is changed.

Continue neutralization with the selected tube, until there is no dip in grid current. Cut less than 1/16 inch at a time off the two in the latter stages of the process. After neutralization is completed, replace the B-plus connection to the final, and the rig is ready for final checks.

Final checks are made with the entire rig assembled, and with the antenna or dummy load connected. Insert an 0-1 milliammeter between the test jack and ground, and start with the regeneration control off, which cuts in the test resistor to protect the final tube. Oscillator and multiplier stages are tuned for maximum meter reading, and the final plate for minimum. Then, turn up the regeneration control to cut out the test resistor, and touch up the tripler and final tuning. The meter reading should be in the vicinity of 0.6 or 0.7 ma. with a supply voltage of about 200 volts. The first time these tests are made it may be necessary to move the output coupling link to get the proper operating current, but after it is once set it need not be changed for most antennas. In computing power input, consider a full-scale reading of 1 ma. to represent 50 ma. of final cathode current, and subtract

about 7 ma. from the cathode current to obtain plate current.

Adjustments of final tuning should be made whenever the transmitter frequency is changed or whenever a new antenna is to be used, to insure against loss of tubes by running them off resonance. Much about the performance of the rig can be learned by loading it into a 6-volt 250-ma. pilot bulb (blue bead) according to the procedures described above. It should light this bulb almost to full brilliance. When modulation is applied, the bulb should get brighter; if it goes dim instead, the final neutralization or the tripler tuning are incorrect, or the coupling to the amplifier is too great.

Power Supply

The power supply required for this unit is somewhat smaller than that commonly used for mobile rigs. The basic drains with the average small vibrator supply are as follows:

Receive Position	40 ma. at 300 volts
Transmit Position	120 ma. at 220 volts
Heaters	2.6 amp. at 6.3 volts

The voltages given above are to be considered maximum voltages; a power supply that delivers 220 volts at 120 ma. should have sufficient regulation to stay below about 300 volts when the load is reduced to 40 ma. Furthermore, it is essential that no more than 220 volts be applied to the transmitter. The rig will function satisfactorily on as low as 150 volts.

Surplus PE-101-C dynamotors were used quite successfully for these units. Designed for 400-volt output with a 12-volt system, it gives the required 200 volts when the two primary windings are connected in parallel and used on 6 volts. With this arrangement, the total battery drain is about 8 amperes.

It will be noted that Pin 4 of the power plug becomes connected to the ground when the volume control switch is turned on. This is intended for the operation of a relay which can be associated with the power unit to turn it on and at the same time to connect 6 volts to the filament lead which enters Pin 2. It is not recommended that this switch be used in place of the relay, because it will not carry the required primary currents.

Conclusion

These units have been used quite successfully for service coverage over a radius of 5 to 10 miles with a fixed control station at the central head-

(Continued on page 128)

How a C.W. Traffic Net Operates

Handling Traffic Is Easy . . . and Real Fun!

BY WILLIAM G. WALKER,* W3NUG

No doubt many of you who work 80 and 40 meters have often wished you could handle traffic but after listening to a net have said to yourself, "I don't understand what they are doing and besides they are going too fast for me." Well, relax and read farther; you'll see how simple their procedure is and how their use of directive signals gives the false impression of high speed.

An amateur traffic net is just a group of amateur radio stations whose operators mutually agree to operate on a single frequency, called the net frequency, under the direction of one station, the Net Control Station (NCS). When in operation such a net is a directed net.

During a directed net session the NCS is in supreme command and no station transmits unless directed to do so by him. Net stations communicate with each other only to transact business authorized by the NCS. This temporary surrender of freedom of action by all net stations is necessary in the interest of expediting the procedure of the net.

The NCS calls the net into session at its scheduled operating time by a short CQ (with an identification such as WPA for Western Pennsylvania Net). Barring unavoidable delays, net members are expected to be on hand at the scheduled time so that a complete listing of the traffic to be handled can be made immediately.

Under today's operating conditions you should either have exact-frequency crystals for the net in which you desire to operate, or a stable VFO. Any power over 30 watts is satisfactory. (In an emergency, use whatever you have.) If you use a VFO, the best method of setting it zero beat with the NCS is to tune him in, turn off the beat oscillator in your receiver, hold the key down (with only the VFO in operation) and set the beat between the NCS and your VFO to zero. Then turn on the b.f.o. and the rest of the transmitter, and assuming that the amplifier stages of the rig have already been tuned close to the desired frequency, you are ready to go. (Every station should have posted a list of dial settings *vs.* frequencies to permit tuning up before going on the air.) If your VFO blocks the receiver beyond the possibility of getting a beat with the signal from the NCS, you can tune him in (with b.f.o. on) to zero beat, and then zero beat your VFO; this is not quite so accurate as the first system, but will be entirely suitable.

Break-in is a "must" these days. Simply use

a separate receiving antenna and key the crystal or VFO with protective bias on the following stages. Leave your receiver on all the time and don't worry about it. Remember, the first-stage tuned circuit will accept the same amount of energy from the antenna whether the voltages are applied or not. You may want to by-pass some of the energy from the receiving antenna to ground through a small neon bulb, or you may want a noise limiter on the receiver output, but let your operating experience dictate what you need. A monitor is not absolutely necessary for net operation since you always send and receive on the same frequency.



Before attempting to check into a traffic net you should become familiar with the most commonly used International Q signals, the QN net signals, and the frequently used abbreviations. The Q signals are contained in every *Handbook*. The QN signals¹ are used principally by amateur traffic nets. The distinguishing letter of each QN signal usually is the initial letter of a word closely connected with the meaning of the signal, some of which follow:

QND Net is directed.
QNF Net is free.
QNH Your frequency is high.
QNI Report (or this station reports) into the net.
QNK Transmit your message(s) for ——— to ———.
QNL Your frequency is low.
QNR Answer ——— and receive traffic.
QNX Station is excused.
QNY Shift to another frequency.
QNZ Zero beat with NCS.

The most frequently used abbreviations are: AA — all after, AB — all before, WA — word after, WB — word before, B — more to follow, BN — between, C — yes, N — no or no more, TU — thank you, SU — see you, BK — break in.

At net time, while the NCS is transmitting the net call-up, each station sets its frequency to that of the NCS. As the preliminary call ends, a member in the net checks in simply by sending only the call of the NCS; when he receives a "BK,"

* 424 Serrano Ave., Pittsburgh 16, Penna.

¹ See ARRL's *Operating an Amateur Radio Station*. This booklet is available to League members gratis upon request and to nonmembers at 15 cents per copy.

he signs and then indicates what business, if any, he has for the net. A station with no traffic would simply say QRU. A station with traffic would state the number of messages (QTC) and the destination of each. The NCS notes this information in each case, acknowledges it, tells the station to wait and then listens for additional reporting stations. When all stations have checked



in, the NCS directs the orderly distribution of traffic. Often he will tell two stations with traffic for each other to "down ten" or "up five," indicating they are to shift frequency by that amount, handle their traffic, and return to the net. Meanwhile the NCS continues to do business on the net frequency, either soliciting calls from late-arriving member stations or directing the exchange of additional traffic on the net frequency itself. A station with no traffic is usually kept on a stand-by basis until it becomes apparent to the NCS that there will be no traffic from others for his city or immediate area, at which point he is usually released from the net. It is a good idea to have a regular policy as to how long a station remains in the net if there is no traffic for him.

Let us now assume that we are monitoring a session of an actual net, in this case the Western Pennsylvania Net or WPA. Starting with the call-up the session will proceed approximately as follows with W3NUG acting as NCS.

(NCS) CQ WPA CQ WPA DE W3NUG QNZ CQ WPA
CQ WPA DE W3NUG QNZ CQ WPA CQ
WPA DE W3NUG QNZ BT QND QNI QTC? K
(Stn. 1) W3NUG
(NCS) BK
(Stn. 1) DE W3MIZ QRU AR
(NCS) W3MIZ R AS
(Stn. 2) W3NUG
(NCS) BK
(Stn. 2) DE W3GEG QTC THREE 1 PGH 1 CALIF 1
ILL AR
(NCS) W3GEG R AS
(Stn. 3) W3NUG
(NCS) BK
(Stn. 3) DE W3NRE QRU AR
(NCS) W3NRE DE W3NUG R CAN U QNI 3RN? K
(W3NRE) C
(NCS) R TU DWN TEN QNR W3GEG CALIF ES
ILL K
(W3NRE) R
(W3GEG) R

This means that W3NRE has signified that he will be able to check into the Third Regional Net, 3RN, at a later hour and will handle any traffic going from the WPA net to the Third Regional Net. Also W3NRE and W3GEG have

been ordered to move to a frequency 10 kilocycles below the net frequency to clear part of W3GEG's traffic.

To indicate that he is now ready to receive more stations into the net the NCS may call CQ WPA again or he may just stand by. Let's assume that no other stations check in and that W3MIZ who checked in without any traffic is still standing by. The NCS may then say, W3MIZ QRU QNX SK DE W3NUG. W3MIZ acknowledges by saying SU SK W3NUG DE W3MIZ.

Immediately after W3NRE and W3GEG have completed their assignment they will again report to the NCS in the following manner:

(W3NRE) W3NUG
(NCS) BK
(W3NRE) DE W3NRE
(NCS) R AS
(W3GEG) W3NUG
(NCS) BK
(W3GEG) DE W3GEG
(NCS) R QNK PGH QRV K

W3GEG then proceeds to send his Pittsburgh message to W3NUG.

After a final CQ to determine if there are any other stations waiting and finding none, the net will probably be freed something like this: WPA DE W3NUG QRU QNF 1929 SK DE W3NUG.

It is a good idea to copy the calls of all stations checking into the net and the traffic they report to the NCS. This gives you an idea of what you may be expected to do and avoids the delay that results when it is necessary for a station to ask questions.

If the NCS does not appear on the frequency at net time, either a previously-designated station or any other station in position to do so will assume the duties and begin the call-up, usually not later than three minutes after scheduled



time. In the event that the regular NCS is able to enter the net later the alternate generally retains control to avoid the loss of time and confusion which would result from a transfer of control in midstream.

Obviously not all nets will use exactly the same procedure but in most cases you will find that when they deviate it is because they have worked together for some time and have simply dropped out some of the signals used above. A few minutes listening should indicate to you their procedure if you must put your traffic into their net. Generally section nets use the complete procedure and it is recommended that you put your traffic into your own section net.

(Continued on page 128)

Civil Defense Keynotes 1951 SET

AREC Members Put On Another Impressive Performance of Emergency Communications in Fifth Annual Test

BY GEORGE HART,* WINJM

SURVEYS and analyses of reports by Emergency Coordinators on the 1951 Simulated Emergency Test held October 13th-14th, indicate that there was some improvement over last year's performance. Although the number of reports received in 1951 (214) was almost exactly the same as the number received for the 1950 SET, statistics show an increase in all other particulars.

Perhaps the outstanding feature of the 1951 SET was the amount of public interest in this activity. Practically every report included a newspaper clipping of one kind or another, and before the week end was over the press was after us for vital statistics on national participation. Even two weeks after the SET, we could only guess at this, since some ECs did not make their reports for months after the event.

This article is not intended as a boost or a glorification of the Amateur Radio Emergency Corps. It is rather a factual report of the 1951 SET, intended to show us exactly where we stand in the emergency and civil defense picture. It is the report to the fraternity by your National Coordinator, indicating the status of the AREC, without embellishment or padding.

Facts and Figures

There are things about a national survey of the SET that can be added up, averaged, and expressed numerically. These things can go in the record book as something to shoot at in future years. But there are other less tangible factors, such as esprit de corps, EC leadership ability, equipment performance and cooperation of community officials which are not always reflected in the dry analytical expression of how many participated, how many mobiles, total points, etc.

The intangible factors in a local AREC or-

ganization are probably more important than those which can be expressed numerically. Statistics can go only so far in indicating the efficiency and potential of any particular group. We can say that in general morale was high, cooperation was unexcelled, equipment performed flawlessly, and ECs demonstrated a high degree of leadership qualities. We can (and do!) say these things and mean them, but we cannot tabulate, enumerate or average them except in a very general way. Here are some of the things which can be expressed numerically:

Total EC reports of activity — 214 (213)
Total AREC members covered — 5395
Total participation (amateurs) — 2757 (2290)
Mobiles and portables — 1305 (1015)
Fired stations on emergency power — 254
Messages from AREC members to ECs — 1996 (1473)
EC radio reports to ARRL — 173
Total points — 24,114 (22,228)

The figures in parenthesis indicate last year's totals, where comparable. In addition, 29 ECs reported that no SET was held by them. In a few other cases, other activities were substituted for the SET. Some ECs held their SET exercises in September or November.

It is interesting to note that of the 214 reports received this year, 122 were reports from communities not reported last year. 47 communities bettered last year's score, and 33 fell behind. 132 of last year's reports were not repeated this year, although ECs in five of these places at least reported that they held no SET.

This is a considerable turnover, when you come to think of it. If all who had reported in 1950 had done so again in 1951, we would have had over 300 reports on which to base this write-up — about the degree of increase one would expect if the percentage of increase from 1950 to 1951 had followed the general trend of previous years. The tabulation on the opposite page, if compared with last year's tabulation (page 53, March 1951 QST) will give some idea of the turnover in reports. All point scores listed are simply contributions to the national total and do not compete with each other. The aim should be to beat last year's "score."



The Oak Ridge gang used an emergency-powered BC-654 and PE-103 on 75 meters (left) and a BC-348 with an Oak Ridge converter (see p. 48, July 1951 QST) to monitor 6-meter mobiles until a simulated power failure. The operators, W4CXY at left, W4RO on the right.



QST for

* National Emergency Coordinator, ARRL.

Albany Co., N. Y. (W2SUL).....	117	Ft. Worth, Texas. (W5ARK) ⁷	156	Pittsburg Co., Okla. (W5BGC) ²	94
Alger Co., Mich. (W8GNS).....	22	Franklin Co., Ohio (W8WAB) ²	235	Portage Co., Ohio (W8BIP).....	71
Allen County, Ind. (W9EOG) ¹	—	Frederick & Tillmore Co., Okla. (W5OJ) ¹	90	Portsmouth, R. I. (W1BBN).....	24
Allen County, Ohio (W8EQ).....	84	Fresno Co., Calif. (W6JPU).....	97	Pottstown, Pa. (W3IGW).....	108
Ames, Iowa & Vicinity (W9NWF).....	54	Fulton & DeKalb Counties, Georgia (W4EJC) ²	217	Puerto Rico (KP4DJ).....	227
Arlington, Mass. (W1BAQ).....	62	Gardner, Mass. (W1ODJ).....	23	Puyallup Valley, Wash. (W7MPH).....	116
Bakersfield, Calif. & Vicinity, (W6EHN).....	134	Glencoe, Ontario (VE3WY) ²	72	Quebec Area, Quebec (VE2QN) ²	235
Baltimore, Md. (W3JCL).....	390	Green Bay & Vicinity, Wis. (W9WLZ) ²	119	Queens Co., N. Y. (W2JSV).....	220
Bannock Co., Idaho (W7BDL).....	60	Greene Co., Ill. (W9IFA).....	58	Racine, Wis. (W9SLZ) ²	145
Baraboo, Wis. & Vic. (W9JEK).....	101	Grundy Co., Ill. (W9AKM).....	42	Ramey Co., Minn. (W8UYY).....	199
Bayard, N. M. (W5NKG) ¹	—	Hall Co., Ga. (W4OSE).....	66	Red Boiling Springs, Tenn. (W4RPT).....	10
Belleville, N. J. (W2JYW).....	82	Hamilton, Ontario (VE3KM).....	162	Ridgefield, Conn. (W1PCH).....	97
Benton & Franklin Co., Wash. (W7OHS).....	197	Hasbrouck Heights, N. J. (W2CCU).....	65	Ridgewood Area, N. J. (W2CGJ).....	141
Big Spring, Texas (W5AW).....	65	Hennepin Co., Minn. (W9RAG).....	197	Rockland Co., N. Y. (W2MRR).....	57
Bismarck, N. Dak. (W6JPW).....	140	Herkimer Co., N. Y. (W2PYC).....	45	Rowell, N. M. (W5ZU).....	140
Black Hawk County, Iowa (W6VRA).....	179	Hinds & Rankin Counties, Miss. (W5EFF).....	97	Rotterdam, N. Y. (W2BRs).....	63
Boise, Idaho (W7GHT).....	141	Iroquois Co., Ill. (W9HKA).....	64	St. Louis, Mo. (W9RCE) ²	303
Boulder City, Nevada (W7HJ) ²	138	Jackson, Tenn. (W4GEH) ²	125	St. Petersburg, Fla. and Vicinity (W4HUY).....	66
Bozeman, Mont. (W7ED).....	48	Jenkintown Area, Pa. (W3QVK).....	81	Salem, Ore. (W7MTT).....	126
Bristol, Tenn.-Va. (W4LY).....	53	Kankakee Co., Ill. (W9ILW).....	64	San Bernardino Area, Calif. (W6HKD) ²	293
Broome Co., N. Y. (W2FCG) ⁵	174	Kapuskasing, Ontario (VE3AVS).....	31	San Diego Co., Calif. (W6VJQ).....	790
Broward Co., Fla. (W4IM).....	103	Keeler AFB, Miss. (W5QMQ) ²	230	San Joaquin Co., Calif. (W6BCL).....	50
Bucks Co., Pa. (W3SSU).....	12	Kent Co., Mich. (W8EXO).....	103	Sarasota Co., Fla. (W4LMT).....	36
Butler, Marion & Chase Counties, Kansas (W9TDW).....	77	Kings Co., N. Y. (W2BIV).....	245	Schenectady, N. Y. (W2GTC).....	101
Calgary, Alberta (VE6TK) ²	196	Kingsport, Tenn. (W4CBU).....	88	Seattle, Wash. (W7NJ).....	350
Centinella Valley, Calif. (W6OJ).....	165	Kirkland Lake, Ontario (VE3PA).....	119	Sedgwick & Harvey Counties, Kansas (W9RC) ²	294
Chittenden Co., Vt. (W1QVS) ²	90	Kitsap Co., Wash. (W7HAD).....	52	Shawano Co., Wis. (W9DCK).....	71
Cincinnati, Ohio and Vicinity (W4NRA) ⁸	185	Kootenai Co., Idaho (W7FIS).....	39	Sheboygan, Wis. (W9MYG).....	54
Cleveland Co., Okla. (W5KYO).....	66	La Crosse Area, Wis. (W9GPT).....	76	Shirley, Mass. (W1IPZ).....	38
Climax, Colo. (W9PNK).....	14	Laramie Co., Wyo. (W7OWZ).....	24	Siloam Springs, Ark. (W5BAB) ²	78
Colorado Springs, Colo. (W6TV).....	158	Lewis & Upshur Counties, W. Va. (W8AUJ).....	32	Silver Bow & Deer Lodge Counties, Mont. (W7FLB).....	108
Conway & Faulkner Co., Ark. (W5QIP).....	66	Lewiston, Maine.....	156	Smithtown Branch, N. Y. (W2JFU).....	133
Cook Co., Ill. (W9SXJ) ²	777	Lincoln, Nebr. (W6DJJ) ²	192	Snohomish County, Wash. (W7PED) ²	231
Crescent Bay Area, Calif. (W6FPD) ²	275	London, Ontario (VE3YJ).....	128	Somers, N. Y. (W2YBK).....	39
Cumberland Co., Me. (W1ITU) ¹¹	88	Lorraine & Mitchell Counties, Texas. (W5AHX).....	17	South San Francisco, Calif. (W6QUL).....	208
Dade Co., Fla. (W4IEH).....	137	Los Angeles & Counties, Calif. (W6ONI).....	69	South Windham Co., Vt. (W9FPS).....	70
Danbury, Conn. (W1ADW).....	46	Lubbock, Texas (W5PXD) ⁹	160	Southern York Co., Me. (W1LKP) ¹	—
Davenport Area, Iowa (W9FTF) ²	121	Madison, Wis. (W9KUZ).....	152	Southbridge & Vicinity, Mass. (W2EFC) ²	86
Davison Co., S. Dak.	59	Manitowoc Co., Wis. (W9FMH).....	110	SW Montreal, Quebec (VE2BR).....	141
Dedham, Mass. (W1SH).....	70	Marion Co., Ohio (W8ZXU).....	75	Spokane, Wash. (W7FQS) ²	423
Detroit Metropolitan, Mich. (W5WFA).....	853	McKean Co., Pa. (W3LQQ).....	77	Springfield Area, Mo. (W9EBE).....	159
Dillon Co., S. C. (W4SOD).....	19	Memphis, Tenn. (W4BAQ).....	223	Springfield, Mass. (W1NLE).....	53
District of Columbia (W3PWB).....	371	Menominee, Mich. & Vicinity (W8GQQ).....	80	Stamford, Conn. (W1PCZ) ²	93
Door & Kewaunee Counties, Ill. (W9OVO).....	91	Meriden, Conn. (W1QMG).....	100	Staten Island, N. Y. (W2VKF).....	151
Dresden, Tenn. (W4FLW).....	35	Miami County, Ohio (W8THJ) ²	79	Stayton, Ore. and vicinity (W7NFI).....	59
Duluth, Minn. (W6HRY) ²	122	Middlesex Co., N. J. (W2BAD) ²	186	Stearns Co., Minn. (W6BRA).....	48
Dutchess Co., N. Y. (W2LDS) ²	73	Missoula, Mont. Area (W7COH).....	65	Sudbury, Ontario (VE3BS).....	134
East Baton Rouge Parish, La. (W5DHE).....	110	Morgan Co., Ind. (W9DUD).....	86	Summit Co., Ohio (W8OAC).....	170
East Lyme, Conn. (W1NBP).....	17	Morris Plains, N. J. (K2BI).....	62	Summit, N. J. (W2CZA).....	111
Eastchester Twp., N. Y. (W2YIA).....	82	Muscatine Co., Iowa (W6FDL) ²	77	Tacoma, Wash. (W7BMG).....	197
Eau Claire, Wis. (W9MUM).....	89	Nashville, Tenn. (W4AY).....	90	Toronto, Ontario (VE3IL) ²	423
Edwards AFB, Calif. (W6VRF).....	111	Nassau Co., N. Y. (W2FI) ^{2,4}	426	Tucson, Ariz. (W7NYK).....	16
Elko Co., Nevada (W7KOA).....	35	Noenah-Menasha, Wis. (W9GJY).....	111	Turlock, Calif. & vicinity (W6FIP).....	103
Emmet & Cheboygan Counties, Mich. (W8RHD).....	108	New Bedford, Mass. (W1AVY).....	77	Tulsa, Okla. (W5GZS) ²	182
Erie Co., Pa. (W3QN).....	90	New London, Conn. (W1BVB) ²	104	Twin Falls, Idaho (W7QTD) ²	69
Eureka, Calif. (W6SLX) ²	127	New Port Richey, Fla. (W4KJ) ²	38	Vancouver, B. C. (VE7DD).....	157
Evansville, Ind. (W9QLW) ²	221	Newport Co., R. I. (W1JFF).....	52	Wabash River Basin (W7TT).....	122
Fairfax Co., Va. (W4KRG).....	97	Niagara Co., N. Y. (W2FAN).....	104	Waltham, Mass. (W1JSM).....	67
Fort Walton, Fla. (W4PLE).....	74	North Bay, Ontario (VE3TX) ¹⁰	86	Washington Co., Okla. (W8CKT).....	104
		Norwalk, Conn. (W1CTI) ²	128	Washtenaw Co., Mich. (W8YJ).....	218
		Oakridge Area, Ore. (W7BSY).....	55	Watchung, N. J. (W2BU) ²	41
		Oak Ridge, Tenn. (W4NDE).....	195	Wausau, Wis. (W9VHA).....	180
		Oklahoma County, Okla. (W5EHC) ²	248	Wayne Co., N. Y. (W2VEY).....	109
		Olmsted Co., Minn. (W6TJA).....	84	Western Kern Co., Calif. (W6HZE) ⁵	57
		Orange Co., Calif. (W6DEY).....	235	Westfield, Mass. (W1BVR).....	13
		Orange Co., Texas (W5NMV) ²	73	Whitman, Mass. (W1RSE).....	52
		Ossining Area, N. Y. (W2PSH) ²	62	Whittier, Calif. (W6RLY).....	149
		Oswego Co., N. Y. (W2ZHU).....	73	Windsor, Ontario (VE3TO) ²	91
		Ottawa, Ontario (VE3OJ).....	98	Winnebago Co., Ill. (W9HOA).....	143
		Panora, Iowa (W6ZFO).....	21	Winston-Salem, N. C. (W4ASQ).....	122
		Passaic Co., N. J. (W2NUL) ²	215	Winthrop, Mass. (W1BB) ²	144
		Peekskill, N. Y. (W2AIH) ¹	—	Woodbridge, N. J. (W2BGJ).....	76
		Pendleton, Ore. (W7BDN) ²	131	Yakima Area, Wash. (W7BUW).....	134
		Petaluma & Santa Rosa, Calif. (W6IEN).....	103		
		Philadelphia Co., Pa. (W3DYL).....	83		

¹ No point score submitted

² Bettered last year's score

³ Test held Sept. 23

⁴ Includes reports by W2KTF, W2TUK, W2GQP for Baldwin, Hempstead-Garden City and "The Five Towns" areas respectively.

⁵ Test held Oct. 6.

⁶ Test held Nov. 29.

⁷ Test held Sept. 25.

⁸ Test held Sept. 30

⁹ Test held Oct. 21

¹⁰ Test held Oct. 20

¹¹ Test held Sept. 9

Yellowstone Valley, Mont. (W7KGF).....	80
Yonkers, N. Y. (W2SNN).....	137
York & Adams Co., Pa. (W3AQN).....	99
National total.....	24,114

Traffic

In previous years, every AREC member participating in the SET was asked to originate a message to ARRL Headquarters. This always gave rise to a tremendous flood of traffic headed toward Connecticut, giving many Connecticut amateurs a golden opportunity to make BPL in the month of October, to say nothing of enhancing the traffic totals of other traffic-handling amateurs who undertook to relay some of these messages. All in all, it helped to give the SET the aspect of a start-of-the-season awakening in both emergency and traffic circles.



W6ZZK operates the key of a small rig set up in the field, a part of the field message center in the Eureka, Calif., SET. The gent looking on is Col. Munroe, Eureka's civil defense head.

In 1951, in view of several comments that this mass handling of traffic was not realistic of a situation which would obtain in an actual emergency, the traffic-handling phase of the SET was done a little differently. Instead of sending messages to Headquarters, AREC members were requested to originate messages in standard form to transmit to their ECs on the local emergency net. At the end of the activity, each EC would then summarize the list of participants and any other pertinent facts in a message addressed to this Headquarters. EC reports on the SET have indicated that 172 such messages were originated by ECs for Headquarters. 182 EC "radio reports" were received here, many from ECs who did not submit subsequent written reports, which indicates that there were more participants in the SET than are actually reflected in the above figures.

No preannounced schedules were published for the 1951 affair, in order more closely to simulate conditions as they would exist in an actual emergency. Nevertheless, Red Cross stations W3PZA, W9DUA and W6CXO were active as usual on the National Emergency and Calling

Frequencies (3550, 3875, 7100, 14,050, and 14,225 kc.). Some 450 messages were handled by these stations and the several other amateur stations in their vicinity who were assisting. This is a slight decrease from the previous year, not indicating necessarily that activity was down, but rather that more emphasis was placed in 1951 on local drills and handling messages at that level, in closer cognizance of what the actual emergency situation might be. Several networks of the ARRL National Traffic System maintained special sessions during the SET week end, clearing most of the traffic at that time and cleaning up the remnants during the regular sessions on Monday and Tuesday. Some traffic routed by other means was quite late in arriving.

Civil Defense Aspects

In those areas where civil defense is well organized, local ECs contacted c.d. officials to put on impressive demonstrations of the versatility and potential of amateur radio in a civil defense emergency. In Cincinnati, the Queen City Emergency Net took advantage of a simulated bombing attack on Anderson Township on September 30th. CAP planes dropped sacks of flour to make a very realistic test, and the QCEN mobiles went into action to show what amateur radio could do. In the Chicago area, 128 amateurs turned out 61 mobile units for a civil defense demonstration which brought high praise, but EC W9SXJ says they can do better. In Orange County, Texas, another simulated atom bomb attack was put on by the CAP on September 23rd, with EC W5NMV in charge of all communications. In Oklahoma City a civil defense emergency was conducted with full co-operation of state and local civil defense, state highway patrol and other agencies concerned; this one lasted two days. In New York and New Jersey, statewide demonstrations of amateur radio civil defense communications were conducted.

These are but a few of the many civil defense exercises conducted over the SET week end or at other times in connection with the SET. On the other side of the ledger, some ECs reported no interest in civil defense and simulated natural disasters such as tornados, wind and rain storms, earthquakes and industrial explosions.

In both civil defense and natural disaster exercises the Red Cross was conspicuous by its high degree of co-operation, as usual.

Publicity

Almost every report contained at least one clipping, and most of them contained several, indicating not only that ECs paid close attention to this phase of the test, but also that there is a high degree of public interest in your annual SET. Although our suggested wording was used in a good many cases, modified to suit the local situation, many ECs found it desirable to use a complete new spread, with pictures and by-lines. The SET, like the Field Day, is fast becoming

(Continued on page 130)

YL NEWS and VIEWS

CONDUCTED BY
ELEANOR WILSON,* W1QON

WHAT does an XYL do when she's married to an avid amateur, but is simply not interested in getting a license of her own? Well, women vary, and their handling of such a situation also varies.

The XYLs of the members of the Southwest Missouri Amateur Radio Club have arrived at a mutually happy solution to the problem (and some do find it a problem). Three years ago the XYLs formed their own club. At the meetings, which coincide with their OMs' SMARC gatherings, the girls work on such projects as teaching each other textile painting, aluminum work, and other arts. On Field Day they spend the entire day together and fix a tasty basket dinner for their OMs. At the annual SMARC picnic they tend harmonies so other XYLs can join in the fun. Also, they cordially welcome new hams and their families to the city.

Only two of the XYLs are licensed — the rest have little or no interest in amateur radio, but they do appreciate the blessings of the hobby.

Net Changes

The YLRL 75 'phone net now meets at 3:00 p.m. Mondays on 3900 kc. W7HHH is net control.

The YLRL 40 c.w. net now meets Mondays at 10:00 p.m. EST on 7075 kc. W3CDQ is net control.

*YL Editor, QST. Please send all contributions to W1QON's home QTH: 318 Fisher St., Walpole, Mass.

The YLRL New York City Club held its annual luncheon and installation of officers in January at the Red Coach Inn, New York City. *L. to r., seated:* W2OVV; W2GQK; WN2IGA (vice president); Helen Zuparn (treasurer); W2EEO (president); W2QWL (ex-president); W2RAQ (secretary). *Middle row:* W2UXM; Jean Merten (of L. I. Group); W2JZX; Mae Gallup; W2PUY; Eva Hudson; W2MEG; W2OWL. *Back row:* Hazel DuBarton; W2IQP; W2PZA; Ruth Schlitt.

Keeping Up with the Girls

A picture of W9GME operating her rig was published in a Chicago newspaper in conjunction with mention of one of Grace's contacts with the now famous Captain Kurt Carlsen, W2ZXM. The picture prompted a barrage of telephone calls from girls interested in learning more about amateur radio. And in Gloucester, Mass., on February 8th, W1RYJ, acting as representative of the Deep Sea Drag Net of New England, presented Captain "Stay-Put" with a DSDN certificate and made him an honorary member of that net. Eather, who recently merited the MM certificate, had previously contacted the Captain on the air several times. . . . If W6NAZ can glean time in between producing and "emceeing" TV shows, she hopes to publish an amended version of the YLRL Callbook. The original book, written in 1949 by Lenore and W6YRL, gives the name, call, address, and a brief account of each YLRL member's amateur activities, hobbies, and other interests. . . . W9PHH's first QSO was with KZ5GQ. Both YLs are just thirteen years old! Other junior YLs are W6JPI, 12, and Susan, W4TAV, 13. Susan is NCS of the KYN and the Ky. C.W. Net. . . . W1ZR handles traffic for MARS — Edith has been licensed since 1917.



. . . QSL Bureau duties leave W7FWR with limited time to operate ten and eighty, but Mary Ann finds considerable satisfaction in dispatching eagerly-awaited QSLs. . . . On January 24th, Chicago's first YL Club was organized. The initial meeting was held at W9FZO's QTH. Interested YLs please write to W9GME. . . . W3NXU is corresponding secretary of the Western Pennsylvania Emergency Net. . . . VE6MP operates between waiting on customers in her "little cracker barrel store" in Chancellor, Alta., population forty. On mail days the whole community gathers at her store, and with colorful human interest supplied by the townspeople and the "thrills" she encounters with her rig, Maude claims no dull moments. . . . W1FTJ
(Continued on page 134)



• Technical Topics —

Pi-Network Design Curves

DETERMINING the proper values for a pi-network tank circuit involves a good deal of computation, as compared with a simple tuned tank. However, for the special case where the network is to couple a tube to a flat coax line, much of the information can be presented in a few curves.¹ To use them it is necessary to know the value of resistance that the power tube must see in order to work properly under the chosen operating conditions, or else to make a reasonably close estimate of it. Also, it is more convenient to

curves, but the formula given is close enough for ordinary amplifier operation.

Fig. 1 gives the values of input and output reactance needed when the Q (ratio of tube load resistance to the reactance of the input condenser of the network) is held at 10. The curves are carried only as far as 140 ohms for the output reactance, since higher values can easily be obtained with a 300- μ fd. variable condenser even at 3.5 Mc. When the Q is 10 (or more) the reactance of the coil averages 25 or 30 ohms higher than the reactance of the input condenser. It should be noted that the output reactance becomes infinite — that is, the output capacitance required is zero — when the ratio of actual load resistance to tube load resistance is equal to the square of the Q . Since the square in this case is 100, the output capacitance is zero for a 50-ohm line when the tube load is 5000 ohms. A higher tube load resistance cannot be "matched" unless the Q is increased above 10. Corresponding conditions obtain with the 75-ohm line when the tube load is 7500 ohms.

Fig. 2 shows the values required when the reactance of the output condenser is fixed at 60 ohms, a median value for both 50- and 75-ohm lines, and one that is useful over at least the range 35 to 100 ohms when the inductance is continuously adjustable. The approximate Q variation for various tube load resistances also is shown. If a larger Q is wanted for low tube load resistances (low ratios of plate voltage to plate current) it can be obtained by reducing the reactance of the output condenser. This in turn requires reducing both the input reactance and

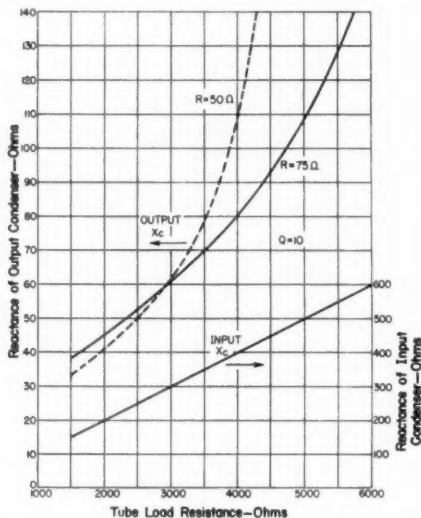


Fig. 1 — Pi-network design curves for working into 50- or 75-ohm loads with a Q of 10.

work with reactance than with inductance and capacitance, since the former is independent of frequency. The reactance values can easily be converted by the usual formulas:

$$C_{\mu\text{fd.}} = \frac{159,000}{X_c f_{\text{Mc.}}}$$

$$L_{\mu\text{h.}} = \frac{0.159 X_L}{f_{\text{Mc.}}}$$

An approximate formula for the tube load resistance is

$$\text{Load resistance} = 500 \frac{E_B}{I_B}$$

where E_B is the plate voltage and I_B is the plate current in milliamperes. An exact formula cannot be given because the actual load resistance required under given operating conditions must be determined from the tube characteristic

¹ Based on the Bruene paper mentioned in the article on pi-network tank circuits in January, 1952, QST.

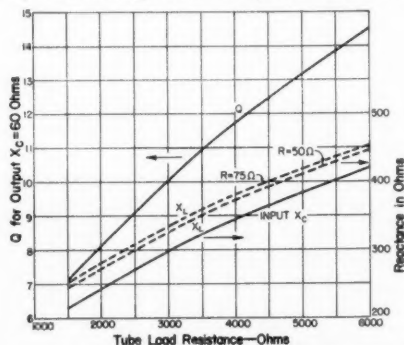


Fig. 2 — Pi-network design curves for working into 50- or 75-ohm loads with a fixed output capacitive reactance of 60 ohms.

the coil reactance, as comparison of Figs. 1 and 2 for values of tube load resistance below 3000 ohms will show.

The same considerations hold when a larger Q

than that shown in Fig. 2 is unavoidable, because of excessive minimum capacitance on the input side of the network. With a tube like the 813, for example, it is difficult to keep the minimum capacitance much below 40 $\mu\text{mfd.}$, including the plate-to-screen capacitance, minimum capacitance of the tank condenser, and strays, which at 28 Mc. is a reactance of only about 140 ohms. Since the tube requires a load between 4000 and 6000 ohms, depending on the operating conditions

used, the minimum possible Q may be well over 30. This means that the r.f. current circulating in the tank is much larger than is desirable — a state of affairs that is not unique with the pi network, since exactly the same thing applies with the conventional tank. With either type of circuit the tank losses in such a case reduce the over-all efficiency very materially, although the tube itself may be operating with just as good plate efficiency as on lower frequencies. — G. G.

"New Theories" on V.H.F. Wave Propagation

LESS than two weeks apart, technical reports have been received from the National Bureau of Standards disclosing two "new" concepts of wave propagation in the v.h.f. range. The first concerns that worst-kept of all secrets, the "big signal" on 49.8 Mc. that 50-Mc. hams the country over have been monitoring for some months. Permission to publish the details of this project has not yet been given, but it is certainly no secret to hundreds of 50-Mc. enthusiasts. Round-the-clock reception of this high-powered transmitter at distances of 1000 miles and more has demonstrated that such consistent DX is not many decibels removed from the limits imposed by the 1-kw. limitation on amateur work.

Because power output in kilowatts and an antenna of rather large proportions were required to demonstrate this capability of the 50-Mc. region to provide uninterrupted communication over 1000-mile distances, it is not surprising that this characteristic eluded hams who have operated on 56 and 50 Mc. over the years. The other NBS report, however, concerns something that v.h.f. men have known for a dozen years or more; namely, that the "line-of-sight" characteristics assigned by many propagation authorities to the frequencies above 100 Mc. represent a very considerable underestimate of the facts of life. This lack of understanding of the true nature of v.h.f. wave propagation was the principal basis for the too-close reassignment of television channels that resulted in the present mix-up in TV allocations.

For years it was assumed that propagation above about 100 Mc. was "optical" in nature; that waves traveled in essentially straight lines, with the reliable range being just slightly beyond the optical horizon. A figure was set for this that made the earth's radius, for propagation purposes, four-thirds the actual radius. Propagation beyond this limit was ascribed to "anomalies," "inhomogeneities" and other terms that seem to delight propagation people everywhere.

As long as low-powered transmitters, relatively insensitive receivers, and dipole antennas were used, observable weather effects could, in fact, account for just about every example of communication beyond the confines of the "four-thirds radius" area. But when more efficient gear began to be employed it became fairly obvious

that something more than unusual or accidental atmospheric effects were involved in the day-to-day coverage that began to be demonstrated. It has been well established by leading 144-Mc. amateurs, for example, that consistent communication is possible, even over fairly high mountains, from low-lying locations on either side as much as 100 miles apart. Daily operation in all kinds of weather over 200-mile paths is not uncommon. It takes something more than weather effects to explain this sort of thing.

The "blobs of air" of the Booker-Gordon hypothesis¹ represent the most reasonable explanation we've had to date, but much experimental work is being done by NBS and others to develop a more exact theory. Experiments are being conducted with the new NBS transmitters on Cheyenne Mountain in Colorado and highly sensitive receiving equipment placed on the sloping plains east of the site. The implications are many, perhaps the foremost commercial importance being attached to the proper interpretation of this theory in connection with TV allocations, and to a lesser extent in all allocations covering the v.h.f. portion of the spectrum.

To the amateur it is important to note this ever-increasing scientific and commercial attention being paid to territory that was not so many years ago the almost exclusive stamping ground of a few hundred amateur experimenters. At least one of our number, the late Ross Hull, was able to make important contributions to scientific knowledge. Many of the rest of us, merely by making large-scale use of frequencies once thought to be commercially valueless, have demonstrated that there are many things as yet not wholly understood by the better scientific minds in the business. By careful observation and reporting of propagation peculiarities we can still aid in these investigations. — E. P. T.

✂ Strays ✂

A combination of disturbed radio propagation conditions and other circumstances resulted in the performance of a ham "scoop" by W0SYN/KG6. By amateur radio he provided Australia's public with its first news of the passing of the late King George VI hours before the BBC's report arrived. — *Guam Daily News via W3SGX*

¹ Moore, "Over the Hills and Far Away," Feb., 1951. QST, p. 13.

Stretching the Junk Box

How To Make Use of Leftovers

BY ROBERT G. SEYMOUR,* W9WJS

A RECENT article¹ in *QST* described in some detail the things to be taken into consideration when building a transmitter. While the information given was very useful, it did not treat what is often more of a problem to many of us; that is, how to stretch what we find in the junk box to cut the cost to a minimum.

Any transmitter I build is a modification of some original circuit taken from a handbook or magazine article. Let us consider the procedure after deciding to build the same transmitter which was described by Goodman in the original article. We have decided that this rig is the one that will most closely fit our needs and the one whose parts we most likely have on hand. We like the idea of including a crystal switch so a look through our stock of switches reveals that we have one that will do, but it has only three contacts. So, holding our breath we look in the tin



can where we keep our dimes and quarters which we laughingly call "radio money." Having already looked in the catalogs we find that the money on hand is enough to cover the cost of a switch, providing no other new parts are required.

Laying aside the question of the switch for the moment, we go on to the other parts requirements. Small parts, such as resistors, are already on hand. Of course, they have been used in numerous other pieces of equipment and the pigtailed are a little short, but that problem can be taken care of by soldering on extensions. The values may not be just what the circuit calls for, but with a little luck we can get by with a few substitutions if they are fairly close. For instance, if we do not have a 47,000-ohm resistor a 56,000-ohm might do. The only way to find out is to try it in the circuit. If the circuit calls for a 0.005- μ fd. capacitor and one cannot be found in our stock of parts, a 0.004 will do — we hope. At any rate we can forget about the small parts until the rig is

• In this little yarn, W9WJS presents a graphic picture of the problems of a ham who is low on cash and yet isn't sure just how far he can go in making substitutions from the junk box. After reading it, perhaps you'll find that you can build that new piece of gear after all.

built and tested, then, if it does not perform the way the article says it should, we can start to suspect our substitutions.

Now we compare the larger parts listed for the circuit with what we have in the junk box. This rig requires two variable capacitors, both 300 μ fd. After a little searching one is found, but it is only 150 μ fd. However, by winding the coils properly, this can be used on 80 and 40 meters, which are the two bands to be used, anyway. But we still need another one. Shall we use the money to get a variable capacitor and forget about switching crystals? Well, let's wait a while before deciding and go on to the other parts required.

What other parts do we need? Well, the circuit shows a 150-ma. meter. Now the only meter that does not already do constant duty is the one in the grid-dipper. Of course, that one has only a 1-ma. scale, but we could use it by winding a shunt for it. But now comes another problem. We do not have the coils specified in the diagram and will have to wind our own, and it will be much easier to wind them if the grid-dipper is in operation, especially since the capacitor on hand is not of the value specified. So we will dispense with the meter and use a pilot lamp instead. We know we are not going to exceed the FCC power limitation with a 6L6 and a pilot lamp will tell us when the circuit is tuned to resonance and tell us if the antenna is loading the circuit.

Now the only thing left is a couple of r.f. chokes, and, lo and behold, here is a brand-new one. Wonder where that came from — must have swapped somebody something for it. That leaves only one choke that we need. Now let's see — there were a couple of chokes in that portable rig that was built to take on vacation last summer. Won't be needing it again until next year and, anyway, if this rig works OK, we can take it on the trip. So now we get out the destruction tools, a pair of cutters and screwdriver, and go to work on the portable. What's this? Here is another variable capacitor, and just what we need. We do not know what the capacitance is but it tuned 80 in this rig so guess it will work OK in the new one.

We can now go back to the problem of the crystal switch. Everything else has been taken care of and the money is still in the tin can. Just

* 567 Elm Grove Drive, Elgin, Ill.

¹ Goodman, "How To Lay Out a Transmitter," *QST*, July, 1951.

how advantageous would it be to have that switch in the circuit? Well, with the switch we can QSY in a second or two unless we make a big change in frequency. If we do that we would have to retune the final and antenna tuner which would take — oh, maybe ten seconds. We could probably change crystals by hand in eight or ten seconds, and another ten seconds to retune if necessary. Of course, this is assuming that we can find the crystals, so we would have to make a point of keeping them handy. So, by using the crystal switch, we can save a maximum of ten seconds or so. Is it worth it? I don't think so. Besides, we will need a couple of beers while sweating out the actual construction, and the "radio money" would come in very handy for that purpose.

The Layout

The next problem is how to fit the parts in and around the holes already on the chassis we found in the junk box. It would be nice to start out with a clean chassis, but we are already using parts that have been used and reused, so why change now?

The thing to do is to choose the chassis with the fewest holes, or the one with the holes most nearly in the proper places. Having done this, we begin. But wait — how about a panel? Let's look back at the article and see what has to be mounted on the panel. Just two tuning knobs, a meter and a key jack. Remember, we have decided not to use a crystal switch, so that will not have to be mounted. We are not using a meter, so the only things left are the two knobs and the jack. The jack and the pilot lamp can be mounted on the lip of the chassis, and the knobs can be mounted directly on the capacitor shafts. So we don't need a panel, and besides, we would have to do without a couple of beers if we wanted to buy one. No panel.



Now, using the available holes in the chassis, we start laying out the rig in the way it is to be constructed. Following the accepted practice of making all leads as short as possible, we can use most of the holes. If a hole does not line up where we want it, we can punch another one — one more won't make any difference in the appearance. But we try to use as many of the existing holes as possible because it saves a lot of work. We want to keep away from making any more large holes because we would have to borrow a socket punch, which, of course, we do not have.

Because we have used this system of utilizing existing holes, we do not have to worry much about the placement of the small parts. They will just have to go in the space available. One thing we must try to do, however, and that is to avoid placing the parts in more than one layer. The reason for this is that, if when testing the rig a change has to be made, the parts are much easier to get at if they are in only one or two layers.

Testing

Before turning on the power we check our wiring against the diagram to be sure we have made



no mistakes. Remember that we have made some substitutions and that what may appear to be a mistake in wiring may not actually be so. Now we plug in the oscillator tube and crystal and turn on the power. Listen to the receiver on the frequency of the crystal. If we hear the signal from the oscillator, we plug in the 6L6 and the final tank coil. After a suitable warm-up we should get an indication on the pilot lamp. But the lamp does not glow. Well, let's try another 6L6 first. Oh, oh. We don't have another. Well, temporarily we can swipe the 6F6 out of the receiver. Now everything is fine, except the pilot lamp will not show a dip in plate current. So now we get out the grid-dipper and find that the frequency of the tank circuit is too low, so we remove a few turns from the coil and try it again. Now we get a dip in current and are ready to connect the antenna. The antenna seems to be loading up properly, so the only thing left is to check the quality of the signal in the receiver.

But now the receiver is inoperative because the output tube is being used in the transmitter. Let's see, the b.c. receiver upstairs has a pair of 6V6s in the audio, and we could probably borrow one without anyone knowing about it. So we get one of the 6V6s and put it in the transmitter, return the 6F6 to the receiver and check the signal. Everything seems to be working fine.

So now we have a new rig ready to try on the air and the beers that we bought with our "radio money" helped us get through the construction and testing without too much trouble.

**SWITCH
TO SAFETY!**



Ten-Meter WAS Contest Results

GETTING off to a slow start, the 1951 Ten-Meter WAS Contest moved into quick action on the second week end and saw some unusually high scores rolled up. The reason for the fast moving second week end was the short- and long-skip conditions that prevailed. Although the magic number 48 wasn't reached there were many reports that all states were heard. Several entrants worked over 40 states and, as in the previous contests, location was not an important factor in ability to work out.

Out of 139 logs submitted, representing 53 sections, W7PUM, Warner Thompson of Arizona, bettered his last year's high score, racking up 35,464 points, 806 contacts and 44 states. Highest state total was worked by W6IYY, having 46 tallied. Other high scorers by call area were:

W1AOQ	12,298	W8RXY	4872
W2TVR	3640	W9RQM	4914
W3PQB	3776	W0HOM	5480
W4PUJ	6360	VE7YR	7296
W5FW	7881	KH6LJ	20,748
W6BTE	19,260	KP4FP	16,340

SCORES

(Scores are grouped by Divisions and Sections. . . . The operator of the station first-listed in each Section is winner for that Section. . . . Listings show score, number of contacts, number of states worked.)

ATLANTIC DIVISION

<i>Eastern Pennsylvania</i>	
W3PQB	3776-118-32
W3QXV	2024-92-42
W3QOR	663-39-17
<i>Maryland</i>	
W3NOL	2626-101-26
W3PKC	2125-85-25
W3ZQ	1026-57-18
W3EGI	4-2-2
<i>Western New York</i>	
W2TVR	3640-104-35
W2QWS	3332-98-34
W2FZJ	1728-72-24
W2FZO	936-39-24
W2BXZ	798-42-19
W2GZX	595-35-17
W2FXA	18-6-3
<i>Western Pennsylvania</i>	
W3LXE	2938-113-26
W3NCF	1050-50-21
W3QN	800-40-20
W3DKL	768-48-16
W3KNQ	524-39-16
W3QYY	250-25-10

CENTRAL DIVISION

<i>Illinois</i>	
W9NJZ	630-42-15
W9LMC	390-26-15
<i>Indiana</i>	
W9KLR	3072-128-24
W9SFR	444-37-12
W9FXV	240-24-10
<i>Wisconsin</i>	
W9RQM	4914-189-26
W9KXK	3068-118-26
W9VHA	140-35-4

DAKOTA DIVISION

<i>North Dakota</i>	
W0BPO	732-47-16
W0DM	44-11-4
<i>South Dakota</i>	
W0BLZ	1656-72-23
<i>Minnesota</i>	
W0JNC	688-43-16

DELTA DIVISION

<i>Arkansas</i>	
W5VN	714-42-17
<i>Louisiana</i>	
W5KC	4000-160-25
W5PXW	3025-121-25
<i>Tennessee</i>	
W1NJE	2424-101-24

GREAT LAKES DIVISION

<i>Kentucky</i>	
W4SMV	136-17-8
<i>Michigan</i>	
W8RXY	4872-174-28
W8NOH	1785-85-21
W8GLK	1782-66-27
W8KPL	80-16-5
<i>Ohio</i>	
W8AJW	4060-140-29
W8WZ	2736-56-31
W8ZOF	1751-103-17
W8PNJ	615-41-15
W8PM	512-32-16
W8AL	495-33-15
W8BSR	96-12-8

HUDSON DIVISION

<i>Eastern New York</i>	
W2DBI	153-17-9
<i>New York City & Long Island</i>	
W2KZE	2240-80-28
W2GTL	950-50-19
W2IAS	450-30-15
W2NNH	150-30-5
<i>Northern New Jersey</i>	
W2DJT	1650-66-25
W2EQS	630-35-18

MIDWEST DIVISION

<i>Iowa</i>	
W8SQN	20-10-2
W0DHF	12-6-2
<i>Kansas</i>	
W0HOM	5480-137-40
<i>Missouri</i>	
W0CWN	2288-104-22
W0CVZ	672-42-16
<i>Nebraska</i>	
W0INR	2668-116-23
W0MGV	91-13-7

NEW ENGLAND DIVISION

<i>Connecticut</i>	
W1AJQ	2652-102-26
W1ODW	180-18-10
W1HDQ	55-11-5
W1ICP	50-10-5
<i>Maine</i>	
W1DFQ	1518-69-22
W1NXX	480-30-16
<i>Eastern Massachusetts</i>	
W1NZD	7224-172-42
W1RVK	4451-131-34
W1TNK	1406-74-19
W1PLJ	994-71-14
W1RGY	448-28-16
W1LMU	390-30-13
<i>New Hampshire</i>	
W1AOQ	12,298-286-43
W1BFT	11,232-288-39
W1JY	658-47-14
<i>Rhode Island</i>	
W1GBQ	2900-80-25
W1AOP	300-25-12
<i>Vermont</i>	
W1AF1	10,070-265-38
W1BJP	594-33-18

NORTHWESTERN DIVISION

<i>Alaska</i>	
K17MF	60-12-5
<i>Idaho</i>	
W7ITN	5841-177-33
W7QY	4760-136-35
W7PCZ	3234-98-33
<i>Oregon</i>	
W7OUT	12,505-305-41
<i>Washington</i>	
W7BGH	12,560-314-40
W7PQE	7720-193-40
W7PHG	4350-150-29
W7JTR	1474-67-22
W7OPO	496-31-16

PACIFIC DIVISION

<i>Hawaii</i>	
K16IJ	20,748-494-42
K16RU	1920-64-30
<i>Nevada</i>	
W7KIO	15,330-365-42

<i>Santa Clara Valley</i>	
W6BTE	19,260-428-45
W6IYY	16,560-360-46
<i>East Bay</i>	
W6VNH	5760-160-36
W6JDO	3528-126-28
W6AJN	3120-104-30
W6RRH	364-28-13
W6EJA	63-9-7
<i>San Francisco</i>	
W6KTV	7992-222-36
W6KKH	4725-135-35
W6YGG	2325-75-31
<i>San Joaquin Valley</i>	
W6VPV	14,212-323-44
W6NCG	5344-167-32
W6KUK	3774-111-34
W6NAS	2185-95-23

ROANOKE DIVISION

<i>North Carolina</i>	
W4FUF	364-26-11
<i>Virginia</i>	
W4RQK	884-52-17
W4KFC	242-22-11

SOUTHEASTERN DIVISION

<i>Eastern Florida</i>	
W4PUJ	6360-212-30
W4OTP	3795-115-33
<i>Georgia</i>	
W4NLY	630-45-14
W4AYF	592-37-16
<i>West Indies</i>	
KP4FP	16,340-380-43
KP4CP	15,525-345-45
KP4JE	756-36-21
KP4KD	646-38-17
<i>Canal Zone</i>	
KZ5CW	25-5-5

SOUTHWESTERN DIVISION

<i>Los Angeles</i>	
W6ZRR	1080-45-24
<i>Arizona</i>	
W7PUM	35,464-806-44
W7PKU	2940-98-30
<i>San Diego</i>	
W6MLY	11,634-277-42
W6NZX	4350-145-30

WEST GULF DIVISION

<i>Northern Texas</i>	
W5FW	7881-213-37
<i>Oklahoma</i>	
W5HFN	5588-138-26
<i>New Mexico</i>	
W5FVO	7644-196-39
W5NXP	7548-204-37
W6ETO	4488-136-33
W5SPQ	4352-128-34
W5TOV	1050-50-21
W5CA	750-50-15

CANADA

<i>Maritime</i>	
VE1MK	336-24-14
<i>British Columbia</i>	
VE7YR	7296-192-38
VE7AAH	3712-128-29
VE7BX	2500-100-25
<i>Saskatchewan</i>	
VE5KR	1368-72-19
VE5QZ	1006-59-17



The World Above 50 Mc.



CONDUCTED BY E. P. TILTON,* WHDQ

What is a Novice?

Ask this question of a low-frequency c.w. man and he'll tell you that a Novice is a high-school lad with a 6V6 or a modified ARC-5, struggling to salvage some QSOs from the mass of QRM between 3700 and 3750. Look at the occupancy of the 2-meter band and you find quite a different picture. There will be quite a few fellows between 145 and 147 signing WN calls, and many of them will be v.h.f. counterparts of the low-frequency version. They'll be running 522s, mostly, but they won't be having much trouble with QRM. Their problem will be to get enough contacts, and to develop their code speed and know-how so as to qualify for General Class permanence within a year.

There will be another sort of ham in both Novice categories, the experimenter; but the chances are that he is more numerous in the v.h.f. group. Like as not he knows his way around technically. He has a 2-meter converter that he built himself, and it may put the receiving gear of some of the more long-standing 2-meter hams to shame when it comes to either appearance or performance. His transmitter may be made of surplus components, but it is home-built, and it will be rebuilt and improved frequently as time goes on. He has a 16-element beam, or maybe even a 32-element.

His interest in 2-meter work is not a sideline or a temporary expedient. He's working the band for all it's worth, and he has some solid plans for increased power when he is over the hump on the code and can go up for the higher grade of license.

What is a Technician?

In many instances he is undoubtedly a fellow who tried for the General Class ticket and slipped on the code. He probably has a Novice

license, too, and the Technician ticket may mean little to him except a renewable license and a callbook listing with a conventional call. But not always!

He may be an old-time ham, who tired of the somewhat repetitious nature of operation on "the communication frequencies." He's willing to concede that working DX on 20 or 40 may be fun, but feels that the end doesn't quite justify the means. He likes to fuss around with equipment, and to do this to the best advantage it's necessary to work somebody once in a while, but talking is secondary to experimenting, as far as he is concerned. He may have a fairly well-equipped laboratory, and it's quite possible that the more active hams of the area come to him for ideas, and listen to his suggestions with respect.

Or he may be a newcomer, enticed into getting a ticket by the fact that none of us knows very much about hamming on the frequencies from 220 Mc. up. We have made only occasional passes at the amateur assignments higher than the 2-meter band; will it not be possible for a fellow who spends all his time there to do an outstanding job, even though he is just breaking into the game?

When you come right down to it, the new hams in our midst are not very much different from a cross-section of new hams of any year or decade. They may have gotten started a little sooner than they would have without the new classes of license, and there are undoubtedly quite a number who might never have taken the plunge, but the important point is that they represent growth, both actual and potential, in a field that has not seen as much growth as we would have liked in recent years. There are more hams using 144, 220 and 420 Mc. today, and that's good, any way you look at it!

* V. H. F. Editor, QST.

New England 50-Mc. men welcome G6DII at Lexington, Mass., March 1st. L. to r.: Cal Hadlock, W1CTW; Arthur Jones, W1XW1; Ernie Grant, W1GJZ; Bill Coburn, W1ELP; Ted Valpey, W1ATP; Denis Heightman, G6DII; Ed Tilton, WHDQ; Doc Farrar, W1CLS.



February Doings

Fear of TVI may be a deterrent to v.h.f. activity, and certainly TV looking has cut heavily into evening operating, but the results of the increasing use of the one-eyed monsters have not been entirely on the negative side. Aurora, tropospheric bending and sporadic-E openings all may show on the TV screens sufficiently to send v.h.f. ops scurrying to their ham shacks.

So it was with aurora in February. Several of the reports received begin with "Saw gray streaks on Channel 4, so checked 2 meters." In the several months since the announcement of ARRL cooperation in the Cornell University Aurora Project we have had little to report, but February provided at least two good sessions and several minor ones. Some of the latter were so brief as to almost escape notice. Around 7 p.m. Feb. 6th, W2SFK, Glens Falls, N. Y., saw streaks appear on Channel 4. Looking out, he saw the aurora brightening in the north. No signals on 2, so he called your conductor on the landline. "Let's get started — the sky's

lighting up!" As soon as the receiver warmed up at W1HDQ we heard W2SFK buzzing through in fine style, calling CQ. We answered and back he came, but much weaker, and dropping out rapidly. Soon the phone rang again, and the familiar voice said, "You've just used up the shortest aurora on record!" Five minutes later there was not a peep to be heard on either 50 or 144 Mc., other than local signals.

Things were better on the 10th. Aurora effect was observed on lower frequencies around sundown, and a number of the gang were waiting for the opening, which broke on 50 Mc. around 6:15 p.m. EST and on 144 Mc. less than 10 minutes later. WICK checked the 6-meter opening as lasting from 6:13 to 9:56. Two-meter reports from W1BCN, W1IZY, W2SFK, W2UTH and W3PMG show that DX was audible on that band from 6:25 to 9:27. An interesting angle on this one is that, though most observers reported clear skies and good visibility, nobody was able to see any visible aurora. There was moonlight at the time, but a bright auroral display would have been plainly visible, even so. W9ALU's reception of W0QIN on 50 Mc. is the farthest west reported on this opening.

The following night was another flash opening around 6:40 p.m. EST. Apparently only W2SFK and W2NLY were quick enough on the draw to catch this one.

Probably the best aurora opening of 1952 so far came on the night of the 23rd — and this was the time that practically every regular occupant of 50 and 144 Mc. in Western Massachusetts and Connecticut was attending a v.h.f. dinner in Hartford! But the rest of the gang did right well, and while there are undoubtedly more reports to come, the batch so far received is impressive. W8FKC was hearing a W4 on 144 Mc. as early as 3:15 to 3:30, but the main session started around 7:30, lasting almost to midnight.

Reports already received from W1BCN, W2ORI, W2SFK, W2UTV, W3KWL, W3PMG, W8EP, W8FKC, W9ARN, W9FVJ, W9OCA, W9PK, W9VZP and W0HVW (Massachusetts to Missouri) give some idea of the extent of this one. Though 2-meter aurora signals are usually weak, this session brought in some S9 reports. Operators all across the territory affected were unanimous in reporting W4AO, Falls Church, Va., "the loudest signal ever heard here on aurora." No phenomenal distances have yet been reported, but the considerable lists of calls heard indicate that we are gradually picking up new converts to this exciting game.

There was widespread 6-meter activity on this one, too, most of the year-round occupants of that band getting in some licks. For W0HVW, Pleasant Hill, Mo., it meant the opportunity to work two near-by states that he'd never been able to snag on ground wave.

So far as is known, no home-station QSOs have been made on 144 Mc. between Arizona and California, and this is not surprising in view of the terrain that lies between the active 2-meter centers in these two states. An interesting bit of police station DX reported by W7UPF, Tucson, Ariz., indicates that 2-meter contacts with Southern California stations should be possible at times, however.

On February 11th at around 11:30 a.m., Don heard a station signing KMA 781, Station F, coming through on the maintenance shop monitor of KOA 255, the Tucson Police, on 155.01 Mc. A brief exchange of calls between the two stations took place at 12:09 p.m. KMA 781 is located in Brawley, Calif., 275 miles away. Their signal was strong enough to be heard plainly by the Tucson mobile units. Surely, the 144-Mc. band must have been open over a similar path at the time.

The v.h.f. get-togethers held intermittently at Oakville Lodge, near Toronto, are known far and wide for the interest and enthusiasm that is always in evidence. Your conductor attended one last fall, and can vouch for their excellence. At the suggestion of VE3ANY, the informal organization in back of these gatherings has now been named "The Southern Ontario and Western New York V.H.F. Group." Next meeting is May 16th at Oakville, with the v.h.f. men of Brantford, Guelph and Kitchener handling the details. It is open to all active v.h.f. men (and women) within traveling range. Each meeting features a technical talk, gab session, and the awarding of "The Order of the Bathtub Plug" to the perpetrator of the worst boner observed on the v.h.f. bands since the last meeting. VE3BQN is the most recent "winner," having taken a trip to Buffalo during the week end of the V.H.F. Sweepstakes, after promising a high score in that activity!

Another group that is doing excellent work in promoting

2-Meter Standings

Call	States	Areas	Miles	Call	States	Areas	Miles
W1HDQ.....	16	6	650	W5FBT.....	6	2	500
W1IZY.....	15	6	750	W5IRP.....	6	2	410
W1MNF.....	14	5	600	W5ONS.....	5	2	950
W1BCN.....	14	5	580	W5FSC.....	5	2	500
W1DJK.....	13	5	520	W5JLY.....	4	2	650
W1CTW.....	12	4	500				
W1KLC.....	12	4	500	W6ZL.....	2	2	1400
				W6WSQ.....	2	2	1390
W2BAV.....	21	7	1175	W6PJA.....	2	2	1390
W2NLY.....	18	6	750	W6EXH.....	2	2	193
W2PAU.....	16	6	740	W6ZEM/6.....	1	1	415
W2AZL.....	16	6	—	W6GGM.....	1	1	300
W2DFV.....	13	5	350	W6YYG.....	1	1	300
W2CET.....	12	5	405				
W2DPB.....	12	5	500	W8WJC.....	21	7	775
W2QED.....	12	5	365	W8BFQ.....	21	7	775
W2FHJ.....	12	5	—	W8WRN.....	19	7	670
W2QNZ.....	12	5	—	W8WXY.....	18	8	1200
W2BVU.....	12	4	260	W8UKS.....	18	7	720
W2ORI.....	9	7	620	W8EP.....	17	7	—
				W8WSE.....	16	7	830
W3NKM.....	19	7	660	W8RWX.....	16	7	500
W3RUE.....	18	7	760	W8BAX.....	15	6	655
W3QKI.....	17	7	820	W8FKQ.....	13	7	—
W3KWL.....	15	7	560	W8CYE.....	12	6	—
W3LNA.....	14	7	720	W8CPA.....	12	—	650
W3GKP.....	14	6	650				
W3OWW.....	13	6	600	W9FVJ.....	20	7	790
W3KUX.....	12	5	575	W9UCH.....	20	7	750
W3PGV.....	12	5	—	W9SUI.....	19	7	—
W3LMC.....	11	4	400	W9EQC.....	18	7	820
				W9BOV.....	15	6	—
W4MKJ.....	16	7	665	W9WOK.....	15	5	690
W4HHK.....	15	6	660	W9MBL.....	14	—	—
W4JDN.....	13	6	—	W9AFT.....	14	—	—
W4JFV.....	13	5	830	W9NFK.....	12	7	690
W4IKZ.....	13	5	650	W9UTA.....	12	7	540
W4JFU.....	13	5	720	W9GTA.....	11	5	540
W4OXC.....	13	7	500				
W4CLY.....	12	5	720	W0IHD.....	15	6	725
W4JHC.....	12	5	720	W0NFM.....	14	7	660
W4OLK.....	12	5	720	W0EMS.....	13	5	1080
W4FJ.....	12	5	700	W0ZJB.....	12	7	1097
W4LRR.....	5	2	900	W0WZG.....	11	5	760
				W0HXY.....	8	3	—
W5JTI.....	14	5	670	W0JHS.....	7	3	—
W5QNL.....	10	5	1400				
W5CVW.....	10	2	1180	VE3AIB.....	12	6	600
W5MWW.....	9	4	570	VE1QY.....	11	4	900
W5AJG.....	9	3	1260	VE3BOW.....	8	5	520
W5ML.....	9	3	760	VE3BQN.....	7	4	540
W5ERD.....	8	3	570	VE3TN.....	7	4	480
W5VX.....	7	4	—	VE3BPB.....	6	4	525
W5VY.....	7	3	1200	VE3AQG.....	6	4	520
W5FEK.....	7	2	580	VE3DER.....	6	4	450
W5ABN.....	7	2	450	VE3EAH.....	5	4	380
W5SWV.....	7	2	—				

v.h.f. and u.h.f. interest is the Two Meters and Down Club of Los Angeles. With an effective membership of about 80, with 40 or more "occasional," this club is a potent force in Southern California v.h.f. circles. Meetings are held on the first and third Wednesdays of each month at Plummer Park, 7377 Santa Monica Blvd., Hollywood. A Southern California V.H.F. Contest was sponsored by the club on the week end of March 1st and 2nd, open to all W6s, members or not, with a special award for Novices. The 1952 slate of officers includes W6VBG, president; W6RJS, vice president; W6EYN, secretary; W6LJO, treasurer; and W6MJ, program director and custodian of the club station, W6FMM. The club also runs a v.h.f. emergency net session each Monday at 8 P.M., with W6IHK as control station.

Overtone Oscillator Tips

The economies effected through the use of overtone crystal oscillator circuits have caused what amounts to a major revolution in amateur v.h.f. transmitter design. Most users are well pleased with their results, but some run into difficulties now and then. W5FEK, Houston, Texas, says that he has used several versions with no trouble of any kind, but a number of his acquaintances have not been so fortunate. Examination of several oscillators that refuse to be crystal-controlled has convinced him that long by-passing leads are usually at the bottom of this trouble.

The same principle applies in case a separate feed-back winding is used. (See Fig. 17-1 in recent editions of the ARRL Handbook for examples). The by-pass (C_2 in Fig. 17-1) must maintain the tap on the coil, or the bottom of the coil when a separate feed-back winding is used, at ground potential, if feed-back is going to be controlled by the feed-back winding. For third-overtone operation the adjustment of feed-back should not be particularly critical, and any crystal that will oscillate on its fundamental should work on its third overtone. For fifth or higher overtones, however, adjustment of regeneration may be quite tricky with any circuit, unless the crystal is particularly suited to overtone operation. It should be possible to get at least the fifth overtone out of practically any crystal, by careful adjustment and proper layout, but not all of them will provide enough output for transmitter applications.

OES Notes

Perhaps it's the result of publicity we've given to the program in recent months, or maybe it is a reflection of the increased v.h.f. interest in many quarters, but in any event our Official Experimental Station reports this month make the biggest file we've had since the OES appointment was announced more than five years ago. In case you've not yet heard all the details of this ARRL appointment, drop a note to your Section Communications Manager (see page 6 of each issue of QST) or to ARRL for full particulars. If you are active on the v.h.f. bands, and interested in promoting v.h.f. activity and progress, we invite you to join the ranks. If you are just thinking of doing something about getting on someday, or are just curious, please don't bother. There have been a few in this category, and they just waste everyone's time.

On the other hand, don't feel that operation of the best station in your section is a requisite. Regular activity and interest in helping others are the most important attributes for a successful OES. Here are a few examples, picked at random from reports received this month.

W2UTH, Rochester, N. Y., keeps a nightly sked with W2THI, North Tonawanda, 65 miles to the west. Though this is a solid circuit, there is a wide range of signal strength, tying in with observable weather effects. During the coldest winter weather the signals were almost uniformly poor, usually requiring c.w. for complete readability. Fair weather and average winter temperatures resulted in good voice communication. Variable and stormy periods have brought variable signals.

W2ZHB, also of Rochester, has also noted large signal variations during the winter. One passing warm front, with receding barometric pressure, brought signals from W2KLZ/2, nearly 200 miles to the east, almost up to summer levels. Activity in the Rochester area has improved markedly this winter, and about 30 stations are now heard more or less regularly. There is more interest in mobile work on 2, and both W2ZHB and W2UTH are building mobile gear. W2ZHB is also revamping his speech equipment to restrict the passband and maintain a high average level of modulation. These inexpensive and simple ways to



W0ZJB	48	W4IJJ	38	W8BFQ	39
W0BJV	48	W4BEN	35	W8LPD	37
W0CJS	48				
W5AJG	48	W5VY	47	W9ZHB	48
W9ZHL	48	W5GNQ	46	W9QUV	48
W9OCA	48	W5JTI	44	W9HGE	47
W6OB	48	W5ONS	44	W9PK	47
W6INI	48	W5ML	44	W9VZP	47
		W5JLY	43	W9RQM	47
W1HDQ	17	W5JME	43	W9ALU	47
W1CLS	16	W5VV	42	W9QKM	46
W1CXY	46	W5FAL	41	W9UTIA	45
W1LLL	44	W5NHD	41	W9UNS	45
W1KHL	44	W5FSC	41		
W1HMS	43	W5HLD	40	W0QIN	47
W1LSN	42	W5HEZ	38	W0DZM	47
W1EIO	41			W0FNM	47
		W6WNN	48	W0TKX	47
W2RLV	45	W6UXN	47	W0KYF	47
W2BYM	44	W6TMI	45	W0HVW	45
W2IDZ	43	W6IWS	41	W0JOL	44
W2AMJ	42	W6OVK	40	W0JHS	43
W2MEU	42			W0PKD	43
W2FIJ	41	W7HEA	47	W0MVG	41
W2GYV	40	W7ERA	47	W0PLI	41
W2QVH	38	W7BQX	47		
		W7FDJ	46	VEJANY	42
W30JU	45	W7DYD	45	VEJAET	35
W3NKM	41	W7JRG	44	VEIQZ	32
W3MQV	39	W7BOC	42	VEIQY	31
W3JVI	38	W7JPA	42	XEIGE	19
W3RUE	37	W7FIV	41		
		W7CAM	40		
		W7ACD	40		
W4FBH	46				
W4EQM	44	W8NSS	46		
W4QN	44	W8NQD	45		
W4FWH	42	W8UZ	43		
W4CPZ	42	W8YLS	41		
W4FLW	42	W8CMS	41		
W4MS	40	W8RFW	41		
W4OXC	40	W8LBH	39		
W4FNR	39				

Calls in bold-face are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.

increase one's effective power should receive more attention from the v.h.f. fraternity.

W3NNV, Colwyn, Pa., lists a 40-clement 420-Mc. beam and 144-Mc. teletype gear as projects that kept him busy during the winter.

W4FLW, Dresden, Tenn., had little activity on 6 or 2 during the winter months, but is anticipating better things this spring. He is arranging test skeds with W4FI, 140 miles away in Gallatin, whom he hears regularly on 6 but not on 2, and would like other skeds with Alabama, Georgia or Mississippi stations on either 6 or 2.

W8WRN, Columbus, and W8FKC, Hudson, Ohio, report that things are looking up on 220 Mc. They say that W8JG is working hard to sell more of the gang on 220 around Cleveland. W8 WM, WJC and RHM are already on, and DQR, VOZ and W3NKM are working on 220-Mc. gear. W8WRN has 8 halfwatts in phase on 220, and is monitoring Channel 13 in both Dayton and Toledo for indications of good propagation. Ken wasted a lot of time getting his rig going on 220 because of two 832As that worked OK on 144 but not on 220. He now has up to 25 watts output from an 829B that will shortly be replaced by an AX-9903.

W8UZ, Columbus, reports reactivation of the 146.34-Mc. emergency net, with sessions each Monday at 8 p.m. He and W8MQV are now working on 420 with modulated

(Continued on page 135)

**M. A. R. S.****U. S. N. R.**

The Southeastern Signal School recently held special ceremonies at the Camp Gordon, Ga., MARS station to honor the 1000th member of the Camp Gordon Radio Club — Private Suekichi Higa, KH6QA, of Hawaii, a member of Student Company 16, Signal Training Regiment. Private Higa was also the last new member to be signed in 1951.

The Camp Gordon Radio Club was founded in December, 1948, and is the brainchild of Colonel R. P. Lyman, then deputy commander, Signal Corps Training Center (subsequently signal officer for Third Army and now serving as deputy commander, Signal Corps Training Center and Fort Monmouth).

Operating with call signs K4WAR and AA4WAR, the club station has been active in amateur and MARS activities, serving as MARS Net Control Station for the State of Georgia.

The club was organized with a four-fold purpose:

- 1) to stimulate the interest of radio operator and maintenance students of the Southeastern Signal School;
- 2) to provide additional training for those qualified radio operators of the Southeastern Signal School who are awaiting shipment;
- 3) to create an additional off-duty diversion for the command as a whole; and
- 4) to establish another link in a reserve communications system in event of civil disaster or national emergency.

The club station is equipped to operate on most amateur bands. In addition, facilities available to club members include a radio theory class for beginners, code practice equipment for both sending and receiving, and listening stations for those not licensed.



Pvt. Higa, KH6QA, receives Camp Gordon Radio Club membership card No. 1000 from SFC Oliver G. Skipper, A4RWZ/W4RWZ, club president. Witnessing the presentation are (l. to r.) Sgt. Ralph Witsiepe, A4SI0/W4SI0; Lt. Col. Fred J. Elser, A4GVU/W4GVU (ex-pi3AA-TA3GVU), council member and assistant commandant of the Southeastern Signal School; Lieut. Freeman J. Fruge, club custodian and company commander of Student Company 31, Signal Training Regiment.

Ohio Flood

During the recent flood in the Ohio area, the Naval Reserve Training Center (K8NAM) at Steubenville, Ohio, and the Fort Steuben Radio Club provided valuable assistance in setting up and providing emergency communication facilities. Radio stations were set up at Empire, Stratton, Brilliant, Mingo Junction, and the Jefferson County Red Cross Headquarters. These stations comprised a network with the training center acting as control station. W8BTW at Wheeling, W. Va., gave valuable assistance in handling traffic.

Amateur operation and frequencies were used exclusively. Frequencies of 1890, 3750 and 3770 kc. were used for traffic handling. Between 1600 EST on 27 January and 0200 EST on 29 January a total of 32 messages was handled.

In addition to the permanently installed equipment available at the training center for such emergencies, two portable TC8-13s from the training center, plus equipment owned by members of the radio club, were used in equipping the net stations. Amateurs taking part in this emergency were: D. Ralston, W8SFI; G. Smith, W8CHE; F. Bishop, W8ZEI; R. Harris, W8MAM; H. Smith, W8EJC (ARRL emergency coordinator); F. Gordon, RMC, W8EZH (stationkeeper); and M. Horne, EMI, W8JEC (stationkeeper).

It is a Navy Department policy that all Naval Reserve radio stations shall have emergency communication plans. These plans are designed to provide cooperation with local authorities on any occasion which requires emergency communications.

Personnel Items

Cmdr. R. E. Coleman, USNR, W1NK, has recently reported to the Office of the Chief of Naval Operations for duty in the Reserve Liaison Unit, Naval Communications Division, as the relief of Cmdr. E. L. Battey, USNR (W4IA). Cmdr. Coleman has previously served as Assistant District Reserve Electronics Program Officer in both the 6th and 1st Naval Districts.

Lieut. Merrill Callum, USNR, W1IAE, has for the past year been serving as the Electronics member of the Sub-Board of Inspection and Survey at Brooklyn, N. Y.

Lieut. Cmdr. F. K. Knight, USNR, W4BIH, has recently been assigned as Assistant District Reserve Electronics Program Officer (Operational Communications) on the staff of the Commandant 6th Naval District.

Lieut. E. T. Maguire, USNR, W1MKN, is now on duty in the Electronics division of the Bureau of Ships at Washington, D. C.

Lieut. Cmdr. C. C. Jones, USNR, W4GKA, is attached to the Office of the Chief of Naval Operations (Naval Communications), Washington, D. C.

Cmdr. A. O. Dority, USNR, W2BBH, is serving on the staff of the Commandant, Potomac River Naval Command, Washington, D. C., as District Reserve Electronics Program Officer.

Cmdr. J. C. Picken, USNR, W4EF, recently reported to the Commandant 11th Naval District as District Reserve Electronics Program Officer.

Cmdr. G. L. Tucker, USNR, W9HF, is now serving on the staff of Commander Naval Forces Philippines as Communication Officer and also as Commanding Officer of Naval Communication Facilities Philippines.

Cmdr. J. J. Zammit, USNR, W5HQP, is at present assigned to the staff of the Commander-in-Chief, U. S. Naval Forces, Eastern Atlantic and Mediterranean.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD/1

Wow:

[... So she can cook, sew, play cribbage and has W3VES for a brother ... what's she got that I haven't? ... Wait'll he next tries to stay on the air all night! ... I'm fed up ... quite, you know. ... Has any reader with a kilowatt and rotary beam the need for a ripping-good gentleman's gentleman? — Jeeves.]

What:

As the Gs so aptly put it, conditions have been grim, grim indeed. A decent opening serves only as a prelude to an ionospheric storm nowadays. While bearing the brunt of these onslaughts, twenty was used by W5ASG to assemble ZS2MI (14 030), ZDs 2GAJ (053) 4BH (092), "UPIAB" (056), VU2NB (095), VQ8CB (102), EL2P (110), FR7ZA (020) and LB6XD (020) contacts. The Fives really have it. W5MPG shows up with F8sBB (060), F8sAB (023), F8sAG (005), CRs 4AE (025) 5AD (015), VPs 3VN (080) 8AO, VK1BS (084), VQ1RF (015), VU2EJ (010), HZ1AR (027), KX6ZA (052), MP4BBD (084), OY3IGO (070) and 3A2AG (018). Another Five, YV5AK, is happy over OQ5s PE (036) VN (050), EA9AB (080), FY7YB (060), ZDs 2S (020) 6HN (053), ZE4JC (060), F8s SAC (010) AS (036) AJ (040), HZ1HZ (095), VQ2GW (090) and VK5XK (120). Manuel embarked on construction of a 304TTL-final rig but found no need to go beyond the 60-watt exciter. [That prefix is worth about 10 db., anyway. — Jeeves] Anybody needing a c.w. Venezuelan may find YV5AK around 7:00 a.m. and p.m. EST, VFO on the low end. ZD2DCP (050), CPIAX (001), VQ4HJP (022), FK8AL (090), ZS3E (032) and FK8AL (090) were raised by W2CTO. Bob met LU9CV personally in the Big Town when the latter's duties as a DC-6 radio officer carried him thither. W2CTO uses 250 watts, a half-wave and crystals for his DX. KR6EO was a new one for W9CKC and W8YGR added EL7A (045). W5KUC's West Gulf Division DX Club DX Bulletin reports these c.w. stations active: (mornings) AG2AG (047), 4PA4 (075), CRs 5AC (156) 9AF (048), GD3GBG (075), IS1FIC (095), HH2L (035), HE9LAA (045), KM6AW/KS6 (052), KJ6AP (020), M33VG (076), MP4KAB (050), LX1AS (090), LZ1LZ (048), FB8ZZ (086), F9QV/FC (023), F8sAB (010), F8sAB (068), FK8AI (078), FK8AG (008), FQ8AE (085), TF3s AB (023) MB (047), EK1AD (074), SU1GO (100), VPs 3FD (050) 8AB (069), ZC1AR (069), ZC4DT (055), ZD9AA (012), ZS8MK (030), YS10 (038), YO 3RD (025) 4CR (012), VQs 4AD (060) 4CM (025) 4BB (024) 8CB (102), VR2CG (151), VSs 6BA (080) 9AC (095) VU2s 2EC (022) 2FH (020) 2JG (098) 4UAJ (081), 4X4s BA (038) CW (080) RE (090); (evenings) CRs 7AN (110) 7CD (024), CTs 2AB (045) 2CC (062) 3AA (120), EA 6AM (096) 8BI (012) 9AP (025) 9BD (075) 9AC (070) 9AD (090), EL2s P (110) R (020), F8sAC (060), FQ8s AK (092) AN (040) AP (050), FM7WF (040), HC20S (040), HRIAT (014), KB6AQ (068), KG4AF (100), KT10C (020), KX6ZA (048), OQ5s CP (086) RA (012) VN (048), OE13SC (001), MC1CG (055), M33US (028), IS1s AHK (090) CNQ (075), JA8AB (075), ZD1WK (007), ST2s GL (019) HL (060) VL (078), SV1SP (075), TF3NA (050), TG9CR (078), VPs 1AA (010) 3VV (080) 5BF (037) 8AE (100), 8AO (005) 8AU (056), VQs 4FCA (080) 5CK (015) 5CW (015), YV5AK (038), ZB2I (050), ZE4JX (074), ZDs ISS (012) 2HAH (067) 2JAB (019) 6DU (022) 6DV (030), ZS3s E (030) P (066) U (032), ZS7s C (005) D (086), 4X4BH (062), 5A2s TN (061) TP (072) and 9B3AA (004) in Bulgaria.

XE1AC returned from his U. S. junket and hit twenty 'phone for EAs 8AV (315) 8AB (140), 5A2TH (343), CR5AC

(156) and VP8AE (098) of South Orkneys. The CR5 is a new one for Al and FB8BB came through with a neat 'phone QSL. W1ICP finds that W9ROQ has been working people like UA9KKB (355), MP4KAF (357) of Kuwait, VP5BF (150) for Turks and ZS2MI (349). He would like to see cards from FD3RC, AP2F, YU7XY, LZ1AA and EA9AI. Additions at W5ASG are KB6AO (250), CR6AV (320), ZPIAE (270) and several already specified. Bill notes that 5A2TH is ex-MD2AM. W4NYN was glad to receive 'phone pasteboards from 3V8BB, SP2AB, PX1A and ZK2AA. Jack nailed down ZD6HJ (161) and a CR6; he wonders why no KX6AC, EA8AC or W6CIE/KW6 QSLs hit his mailbox. Here's what W5KUC's W5 sleuths have been stalking: (mornings) CN8FZ (205), GD3GBG (325), IS1FIC (374), MF2AA (350), M33RK (192), HZ1s TA (345) TD (350), SP5s AB (127) AG (127), TA2EFA (330), TF5SV (305), VQ9DB (309), VU2s AK (155) CN (285) CP (198) CQ (350) FH (140), Y13BZL (125), ZB1AJX (145); (evenings) CR6s AJ (385) AM (148), CTs 2AE (118) 3AA (070), EA8s AP (388) AW (301) BL (378), KT1BB (340), LX1DU (220), M33RR (321), OQ5RA (330), OX3MW (355), TA3AA (370), VK1BS (255), VP2s AF (370) DP (335) LE (200), VQs 2DT (390) 2ET (376) 3CP (305) 4AC (381) 4ERR (372) 4RF (382), ZD4s AX (150) BF (125), ZE3JY (318), ZPs 1AE (270) 4BB (281) 3NB (280), ZSs 3D (352) 8A (318) and 3V8BB (390). There appears to be a scarcity of modulators in those French possessions so active on c.w.

Forty is as wobbly as ever, Jeeves' derisive verse of last month notwithstanding. W8KPL came away with FF8AC (7030), YV6AO (070), HP1LA (070), CE1PW (090), VP5BN (040), HR2AD, T12s AP CR, OA4ED, HK4DP, VPTNM and KH6AD/KW6 (020). W2AIS, very close to his 100th 7-Mc. country, finds it irksome to hear Central and South Americans on 'phone in countries he needs badly. ZS6OS (005) tells W3JYS he needs but a few more states for his 40-meter WAS; W1DJV reports a hefty signal from VP9AL (085). If you find crossing the ponds too rugged a job you might fish for a rare Cuban district in CMLAR as worked by W8CKC. Then look for CM4HT, the only Isle of Pines licensee. W2CTO tried 40 and found VQ2GW, ZS3K and VP6FM workable. W5KUC's cohorts hear of ZK1AB (035), IS1AHK (024), VP7s NG (018) NZ (010), YU 1AG (022) 2ADE (040)



* Please mail all reports of DX activity to DX Editor Newkirk at ARRL Headquarters, 38 LaSalle Rd., West Hartford 7, Conn.



A Massachusetts DXCC get-together brought top 'phone men (l. to r.) W1JCX, W1NWO and W1FH into camera range. Of course, the latter bats out a little c.w. now and then! (Photo courtesy W1MB)

2AKL (021), ZD4AB (020) and 4X4CJ (020).

Eighty is getting squeeze to the last drop, to coin a tense. Via W1ZL we hear of W4BRB's contacts with PZ1LZ, ZD4AB and KH6QY/KC6 (3510); W8BKP and W6ZAT also notched the KC6 and the latter added DU6CO and VS6CG. Mind you, this is 3.5-Mc. stuff! Between 3504 and 3520 kc. VE1JD has been working LU3EL, CT3AB, VP5AR, KV4AU, DLs 1AO 3LK, Gs 3FGT 5BJ and 5RV. Liz is planning an 80-meter ground-plane.

EA1BC (3505) answered W2ESO and W7PQE ran across ZLs 1CI and 4BO. W1AW (Chas) says the early a.m. is good for ZLs 1AGE (3558) and 3JT (3557). W8BKP has a 715-foot wire some 125 feet in the air at one end and 55 feet at the other. Among George's QSOs we find items like VQ4CM, OX3EL, YO2RF, YU3APR, ZK1AX, FK8AL, OKs MB MQ, KS4AQ, VK2RA, SM7YO, HPIAW, FA8DA, LA6U, CX1BR, OZ5AA, GW3EJD, CT2BO, ON4MF, 984AX, 15 Gs, 10 ZLs and over a dozen other assorted Europeans and North Africans. This was routine non-contest DXing, too.

The inspiring status of *ten* is decisively indicated by W4RNP's comments on European openings—"they may stay in for all of five minutes on good days." Don captured VQ2GW (28,200), CR4AE (490), HR1KS (300), CR6BX (400), HB9JQ (300) and YV1BE (300). W4RNP's shack is within an all-metal house overlooking Roanoke; TVI is negligible. CR6AT, OQ5 RU VD, EL18A, TG9AD and ZP7AW chatted with W2ZVS. A 4-element whirler with 807s got OQ5 CC CJ BG VP, VQs 1RF 4RF 4BU 4AC 2JN 2C, EA8AX, CN8FB, CR7IV and a host of ZS/ZLs for W5RDA.

Full-sized rotary beams on 7 Mc. are about as plentiful as three-dollar bills. This 3-element yagi behemoth at W4HQ (ex-W1OJM) has a measured forward gain in the vicinity of 8 db, with a front-to-back ratio of some 30 db. Relays permit its use on 14 Mc. as a 6-element phased array with gain figures roughly the same.

The 65-foot three-legged tower is built of timber felled locally and a war-surplus SD-4 radar rotator does the spinning. RG-8/U feeds the driven element; the 64-foot elements, which taper from 1 1/2- to 1/2-inch outside diameters, are sway-braced by copperweld-wire guys to minimize droop. The 34-foot boom of 2 x 4s provides 17-foot element spacing.

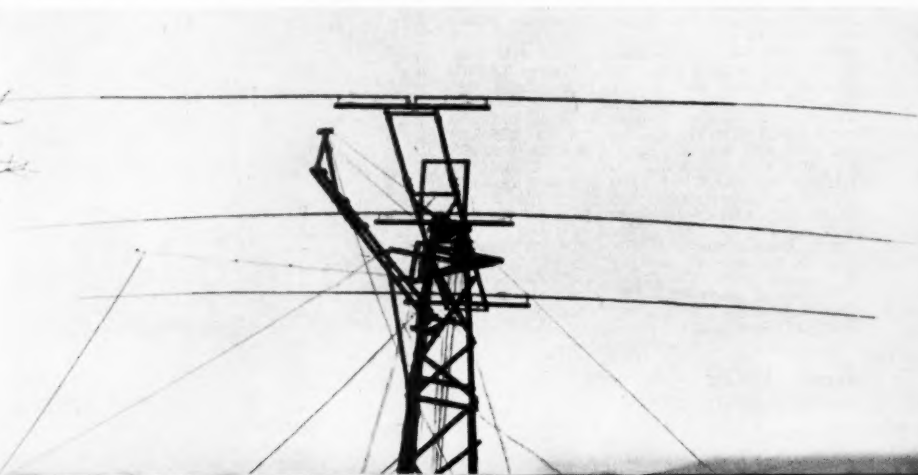
Operator-builder Ambrose Kramer first constructed the beam to supersede W1OJM's 600-foot-per-leg Vees at Waltham, Mass. It gave such a superb account of itself that he transported the boom and elements to his new "farm" location at Bumpass, Va., where over 100 countries were contacted in a month's operation as W4HQ. The antenna is especially an asset in 40-meter contest work as even competitor W1KFC will admit!

The one-sixty DX Tests had rough going during February. An abnormally high static level plus loran splatter harassed all concerned. W1BB QSOd G5JU while hearing Gs 3DIY 6GM and GW3FSP; VE1EA's contacts included G5JU and G3DIY. KV4AA gave many consolation QSOs to those who found the Atlantic too tough a barrier. W1s EFN LYV TCR TTV, W2s COR EQS LUD MX, K2USA, W3s HL KQR OKU PKC KWA RGQ, W8s BKH LJH, W9s CVQ NH and VE1HJ were among participants on our side. VE2WW was in there pitching with a balloon-supported dipole, results unknown here.

Where:

The Ceylon QSL Bureau is now under the wing of V87NG. Address: Noel Gunasekara, 158 Queen Marys Road, Gampaha, Ceylon. The block 5A2C has been assigned to Cyrenaica and 5A2T to Tripolitania. The former may be QSLd via RSGB and cards for 5A2T stations go via M/Sgt. E. R. Halversen, 5A2TR, 34th Radio Sqdn., APO 231, Postmaster, New York, N. Y. These are not separate countries; both represent Libya on the Countries List.

CN8FZ	(QSL via W0HIL)
CR6BX	Box 1345, Luanda, Angola
EA9BD	(QSL via URE)
FF8AI	J. Maillet, Inspection Academique, B.P. 211, St.-Louis, Senegal, F.W.A.
FK8AH	R. Garbe, 26 Q.L., Noumea, New Caledonia
FK8AL	J. Garbe, 26 Q.L., Noumea, New Caledonia
FK8AM	F. Cousin, Anse-vata, New Caledonia
FK8AN	G. Cortot, Electric Radio, New Caledonia
FO8AD	Ile Rapa, Grande Australie, via Tahiti
FQ8AF	P. O. Box 218, Brazzaville, F.E.A.
FQ8AH	A. Weilly, Box 180, Libreville, F.E.A.
FQ8AL	G. Vidal, Service Navigation, Fort Archambault, Tchad, F.E.A.
ex-KG6GC	K. K. Wilkason, Box 428, Hillsboro, Ill.
OE13RL	L. R. Lister, 12th Radio Squad Mobile, APO 61, Postmaster, New York, N. Y.
OQ5VN	Bbox 631, Elizabethville, Belgian Congo
PX1YR	Yves Ramond, Andorre-la-Vieille, Andorra
TA3AA	Sgt. E. Bernfeld, TSAFG, JAMMAT, APO 206A, Postmaster, New York, N. Y.
TA3QZ	Lt. H. C. Harris, jr., TUASFG, American Embassy, Ankara, Turkey
VP7NZ	(QSL to W6NZ)
VQ2JW	Nangweshi, P. O. Secheke, Barotseland, via Livingstone, Northern Rhodesia
V87ES	E. Savundranayagam, 30 Horton Place, Colombo 7, Ceylon
ZD2GAJ	Bureau of Commerce and Industry, Lagos, Nigeria





FB8ZZ is the reason for many a scramble on 20 meters these days. This station will continue active on Amsterdam Island for quite some time. (Photo courtesy W1FH)

9S4BE R. Mayer, Am Galgenberg 26a, Elversterg, Saar

W1s IKE MCW NWO RWS TSZ, W2s CTO FQG, W3DLI, W4CYY, W5ASG, W8YGR, W9TRD, W0AII, N. Duxbury, West Gulf Division DX Club's *DX Bulletin*, Northern California DX Club's *DXer*, Southern California DX Club's *Bulletin* and OSV's *OEM* all had their shoulders to the wheel on this run.

Tidbits:

According to W3ASG, ZS7B intends to visit St. Helena for two or three months and roll up some two or three thousand QSOs. Not counting dupes, this should give us all a good shot at ZD7. From OK1MB via GI5UR: LBs 6ZD and 8HC represent Jan Mayen and LB5ZS is good for Spitzbergen. There is a 6K6AA operating 20 meters as a QRP ionosphere-sounding rig in Budapest, says W9TRD. When he raises power will he be signing 6L6AA? W5FXN learns there will be a native TA on the air soon which will be the first, we believe. EA8AW's Ifni and Rio de Oro jaunts as well as the XE4PK Revillagigedo expedition were delayed beyond their original departure dates. They're still cooking, though. FK8AC has left for a year in France and will sport an F call ere long. Felix has his New Caledonian logs along and will be glad to replace lost, strayed or stolen QSLs. Write: Felix Franchette, Villa "L'Oustalet," Tamaris-sur-Mer, Var, France. For the unfortunates whom it may concern, ZK2AB has worked only 3.5 Mc. and that for just a week or so in December of 1950. Pirating of his call resulted in a stack of 14-Mc. QSLs which he cannot acknowledge. ZK2AB does intend to put a pair of 807s on 20 meters shortly and will then QSL thoroughly. The Marion Island outpost, ZS2MI, collects meteorological data for a proposed airline from Natal to Australia. The rig runs 100 watts, the receiver is an HRO and a diamond is beamed on South Africa. If you need cards for your contacts with W6ATB/KG6/KC6 or KG6GD/KC6/C3/AM, drop the details to Pete Peters in care of W6SJK. W6ATB will be back in the swim directly. OX3BI (ex-OX3GG) is making tracks back to W4KAR in Va. Before leaving Greenland, Frank unloaded over a thousand QSLs W/VE-ward, all via bureau. His relief at the NBS outpost will also be a ham, call unknown. W3JSH was bitten by the DX bug during a ZL QSO and currently is the DXingest YL on 80 c.w. AC3PT tells WIBDI that AC3SQ is the only other active Sikkim station. W3MFW heard more St. Helena talk from ZS2KF—the more the merrier! OX5EL relates to W4CYY that three OYs work 3.5 Mc. regularly. Two hit twenty now and then and that we know. The Jubilee Royal Adelaide Exhibition will have a VK5 station on the air from March through May. Forty and twenty will be used and specially prepared QSLs will be forthcoming. The director of Radio Vatican reiterates to HB9FI that the Vatican State does not tolerate amateur radio. All stations who have used, are using or will use the HV prefix—pirates. We re-

gret to see Ed Miller, W2ZJ, among Silent Keys. Old timers will remember Ed best as W8CJJ. Among his accomplishments under that call was a prewar DXCC. Information on present whereabouts wanted: W2WMV/C9 by W3KT, KS6RR by W3SWG and KR6AS by W2ZVS. The KT1 label is now official for U. S.-citizen Tangier stations. Novices there will be WT1s. Ex-SM5XH former veep of SSA (Sweden), writes interesting lines from his new Philadelphia residence. He points out the possibility of new country material in the Baltic Sea island group of Aland. Jan says the folk there maintain their own parliamentary self-government as guaranteed by the Finnish constitution. The question: Are there any OHs active in Aland? Anyone needing confirmations of contact with DL4FA, F7AT, PX1AR or 3A2AG would do well to submit details to Warren's home QTH at W0HZA. While in Monaco, he found the 'phones of W7HIA, W1FH, W2APU and W1JCX to be standouts on 20. Add Firsts: 3A2AG worked 3A2AN for the first reported 3A2 two-way. Ex-W7MJC tells WIBDI that several Novice licensees are active on Guam. They'd like the W/VE gang to watch for them on 11 meters. Karl of M13LK, formerly W3NLS, advises us to be on the lookout for ST2US, a projected radio safari into the Sudan. Some spot for Field Day! ZS6EV, quite active on 20 c.w., is bedfast in a Johannesburg hospital. A 20-watt rig at his bedside helps pass the time and he likes to work Ws. This from W8SYC. W8YGR ran into old friend KP4HU who was operating from Tennessee, of all places. Mac is probably thinking up another choice spot from which to roll up one more DXCC. VP1NW will be on with a VP5 call in Jamaica very soon, according to W8YGR's notes. W8UPN hears from OX5EL who may return to the Faeroes ere long as OY5EL. Writing from Kabul, KH6HM states that he couldn't wangle a YA license anyhow. "Amateur radio is absolutely unauthorized in Afghanistan . . . any station using the prefix YA is not



Spanish Guinea is not as rare as it once was, thanks in part to Jose Civit of EA0AD. Operation is mostly on 14-Mc. c.w.

legitimate." Period! IICCO tells W1UJX of M.I.T. that his local gang is very short on radio literature of any date. Rather than throw 'em away you might ship same to: Como Radio Amateur Club, IICCO Secretary, Piazza Peretta 4b, Como, Italy. W1UJX finds that amateur radio licenses in Italy are issued on a "30-day permit" basis; lots of renewing necessary. 9B3AA is perfectly okay for Bulgaria; W2WZ and others have his QSLs. The fellow especially likes to work South Americans on 20 c.w. with his 5-watter. W2WZ adds that VR3A now signs VK9RG. Al and this column would appreciate knowing the present whereabouts of ex-JA1J. In April ZD6DU expects to return to the U.K. and G2HDU. "It's surprising how many stations, W and others, say 'first ZD6 QSO' . . . I'm very pleased to give these boys a new country. They'll all get cards in due course." ZD6DU runs (Continued on page 156)



Hints and Kinks

For the Experimenter



BASE-FED VERTICAL HALF-WAVE ANTENNA

It is usually much easier, from a mechanical viewpoint, to base feed a vertical antenna than to feed it at the center. The electrical problems involved are usually tougher to handle with base feeding, especially when the antenna is to be fed at a high-impedance point, as is the case with a half-wave whip.

The system shown in Fig. 1 was worked out as a very satisfactory solution to the problem. In addition to giving the desired impedance match, it permits the use of coaxial cable at the output of the transmitter so that a low-pass filter can be inserted to eliminate TVI, and requires no antenna tuner. A quarter-wave section of 600-ohm line is used as a matching transformer to give a step-up ratio. This is simply an inverse use of the system frequently used to feed the radiator of a beam antenna where center feed must be used with open-wire feeders. In our case the transformer is used to secure a step-up to about 5000 ohms. The system is, of course, applicable to either vertical or horizontal antennas when end feed is required.

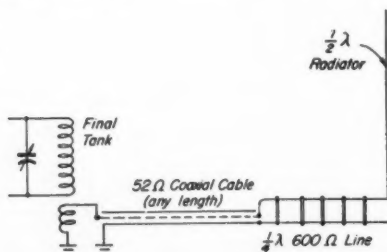


Fig. 1—W4FPK solves several problems at once with this base-fed vertical half-wave antenna. Either RG-8/U or RG-11/U coaxial cable may be used.

The installation of a low-pass filter in the coaxial line resulted in subsequent elimination of TVI, and the vertical antenna seems to be very effective for DX work in the 14-Mc. band.—R. J. Miller, W4FPK

HOME-BUILT SHIELDED PLUG-IN COIL FORM

Shown in Fig. 2 is an inexpensive way to build efficient shielded slug-tuned plug-in coils. The base is a male cable connector with shield (Amphenol), and the form is a cut-down slug-tuned unit from surplus radar gear. Almost any small-diameter form will do as well.

Fig. 2—An ingenious coil form devised by ZS5KU. It uses an ordinary cable connector to make a shielded plug-in coil form with provision for slug adjustment through the top of the shield.



A piece of wire is soldered to the shield and connected to one of the pins for grounding. The slug is adjustable through the cable entry bushing at the top of the shield.

While the commercially-available units probably have lower losses, they are much more expensive. These forms do a fine job for me in a home-built "R9-er," and are scheduled for use in a new converter that is now under construction.—Jack Whitte, ZS5KU

TVI TREATMENT FOR "COMMAND" TRANSMITTERS

In fringe areas, TVI is a distinct possibility with the low-frequency "Command" transmitters. We encountered it in a BC-457A unit that had been modified "as per QST"¹ for use by WNØFVK, but found that it was curable by the following means.

First, provisions were made for use of an antenna coupler with the unit. This entailed removal of the existing loading coil, and substitution of a coaxial output connector for the binding post. Next, the entire unit was shielded. The "window" was covered with a sheet of aluminum, and the side louvers in the cover as well as the rear opening of the cover were shielded with fine-meshed copper screening. The keying jack and all supply leads were by-passed with 0.01-μfd. disk ceramic condensers installed right at the power socket.²

After these modifications, no traces of interference were noted on the nearest TV set, which is only 25 feet away from the transmitting antenna. An incidental benefit obtained was the elimination of a case of BCI in a garden-variety a.c.-d.c. set that was installed in the same room with the transmitter.—James F. Quigley, WØFQO

¹ Bradley and Smith, "The Novice Conversion of a 'Command' Transmitter," QST, November, 1951.

² Grammer, "By-passing for Harmonic Reduction," QST, April, 1951.



Correspondence From Members-

The Publishers of *QST* assume no responsibility for statements made herein by correspondents.

HERMETICALLY SEALED, TOO

756 Francis Dr.
Wantaugh, N. Y.

Editor, *QST*:

There are some members of the radio amateur world who will be interested to learn of a resistor now on the market which has proven to be of great value when it comes time to test and adjust transmitters. These resistors can be inserted in series with the primary of the high-voltage transformer to drop the voltage to such an extent that the off-resonance life of vacuum tubes is extended considerably. These resistors can also be used instead of an antenna in the output of the final being adjusted. They come in various resistance values and various wattages. On a dollar-per-watt basis these resistors are extremely cheap. They are easily mounted and replaced. A mounting assembly can be purchased at most any hardware or dime store.

In addition to the above, these resistors have many other uses and advantages. For one thing, they give visual indication of their operation and give an idea of the power being dissipated. They are quite non-linear and can be arranged so that a slight increase in load will cause their resistance to soar to a value where no damage will be done to circuits they protect. Some of those designed for lower voltages make excellent fuses and do not introduce much of a voltage drop.

This modern refinement of some research done by T. A. Edison is now so widely used in home and industry that it can be purchased almost anywhere.

— Charles J. Herzer, W2CEP

NOVICE QRM

R. R. I
Fredericton, N. B.

Editor, *QST*:

This is a recommendation that the Novice class amateurs should have their frequency range moved to the c.w. portion of the 80-meter band and off the Canadian 'phone band. Since American amateurs have been given an extra 50 kc., it is only fair that we Canadians should have full use of the extra 25 kc. allotted to us without having to share it with these c.w. stations. As it is now, only the higher-power stations can make use of the range 3725 to 3750 kc.

— E. A. Urquhart, VE1OL

PI-NETWORK TANKS

700 East Broad St.
Falls Church, Va.

Editor, *QST*:

The article by George Grammer, WIDE, "Practical Applications of Pi-Network Tank Circuits for TVI Reduction," in the January, 1952, issue of *QST*, is an outstanding example of the contribution of ARRL to progress in amateur radio. Here is a basically new concept in tank circuits, so far as general amateur construction practice is concerned. It promises to be a boon in reducing TVI and offers great convenience in bandswitching and control of loading. Needless to say, I am building up a small rig to try this out for myself.

I would like to venture a prediction that you have started a major trend which will gradually extend even to the kw. power level. The first indication of this is in the advertising of a continuously variable inductor; no doubt other component manufacturers will also increase their emphasis in this direction. In a few years, the plug-in coil and swinging-link tank circuit may be as obsolescent as the push-pull triode final is today.

My congratulations to you for this latest evidence of your competent leadership.

— Emmett P. Bonner, W4MXP

BAND-EDGE VIOLATORS

3428 5th Ave., S.
Minneapolis, Minn.

Editor, *QST*:

Whether the situation is becoming worse or whether I have just started noticing it, an alarming disregard for the band limits has appeared, especially on the 20-meter 'phone band.

Listen any week-end afternoon near 14,200 and 14,300 kc. and you will see what I mean. Violators range from fellows who zero-beat everyone they call from force of habit to hard-shelled old-timers who will risk a pink ticket to get through the QRM.

It is not the murredding of a dial or the sudden change in otherwise stable oscillator characteristics (perhaps good excuses) but carelessness, ignorance of equipment limitations, and an apparent contempt for the regulations that causes most of these violations. Certainly such operation does not interfere with commercial services, but where is the awe with which we have traditionally regarded our regulations? . . .

— R. W. Schoening, W0TKX

7 MC.

9463 Knodell
Detroit, Mich.

Editor, *QST*:

When the a.m. and c.w. boys start to fight each other about the 7-Mc. band proposal, why not open up 7 Mc. to those who pass the new Extra Class exams?

That would only put the fellows who work hard in ham radio up there and also would encourage more to apply for a new ticket. I think that would stop a lot of fighting and would also get a lot of bum signals off.

— Marion B. Orchard

735 Broadway
Venice, Calif.

Editor, *QST*:

I am very strongly in favor of a proposal being made to the FCC to create a Novice band in the high-frequency end of 7-7.3 Mc. amateur band.

— Edward F. Munsell, W6PCP

4554 Marmian Way
Riverside, Calif.

Editor, *QST*:

If the 40-meter band is to be cut up into 'phone and c.w., why not cut a chunk out for the Novice? His band is crowded and it would help amateur radio to put him up there. Let's try and keep the whole band c.w. There are enough 'phone stations on the 40-meter band now to cause lots of trouble for c.w.

— Raymond E. Hanson, W6KXE

1578 Seminole Blvd.
Ocala, Fla.

Editor, *QST*:

No U. S. 'phones, please. Down here in Florida, we are very close to some of the foreign 'phones often referred to, and many kilowatts are in the air. Thankfully, they are mostly in the higher end, but the advent of U. S. 'phone there would send them to the lower portion of the band faster than the ear could follow.

(Continued on page 138)



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
JOHN E. CANN, WIRWS, Asst. Comm. Mgr., C.W.
GEORGE HART, WINJM, Natl. Emerg. Coordinator

J. A. MOSKEY, WIJMY, Deputy Comm. Mgr.
L. G. MCCOY, WIICP, Asst. Comm. Mgr., Phone
LILLIAN M. SALTER, Administrative Aide

Rag Chewers Club. *Operating an Amateur Radio Station* (page 7) tells all about the Rag Chewers Club. Fraternal QSOs of at least a solid half hour held with a member of the club are required to qualify one for nomination by that member. When the Old Sock (chief rag-chewer) has both the member's nomination and one's own request for RCC certification, membership certificates are sent. The precepts for this fraternal group: (1) Be a conversationalist . . . talk and get to know the fellow you QSO. (2) Operate in strict accordance with FCC rules and ARRL practice. (3) Observe rules of courtesy on the air. (4) Sign RCC so others may know you.

All classes of amateur licensees may belong to the RCC. ARRL certifies some two thousand new RCC members per year. You will find them, if you mention RCC, in any or all bands. As a help to newcomers there follows a list of WNs certified as RCC members to the time of writing these lines.

WN1:	IFU	TKE	WN6:	HQH
TTK	IGS	TLA	BXE	ICU
TTM	INI	TLW	CCO	ICV
TTO	IVN	TMV	CET	IDE
TTY	JCO	TNC	CRA	WN9:
TUT	JDH	TPA	DPL	OGP
TVB	JIG	TPU	DVJ	OGY
TWG	JQU	TRP	EER	OHU
TWR	JWU	TVQ	GZK	OKMI
TWS	KAC	TVS	HBH	OLS
UBB	WN3:	TVW	NIE	ONG
UBL	RXV	TWX	NZX	OZN
UBM	SAF	TYV	OMD	PAS
UCA	SAN	TYW	OQZ	PEC
UCO	SBE	UDS	OVJ	PVH
UFH	SFR	UFB	OYR	PWD
UFN	SIJ	UFD	WN7:	QAM
UFT	SMC	UGH	PQS	QCH
UIQ	SMJ	UGT	PUV	WN8:
ULL	SUJ	UIO	PWA	ECD
WN2:	WN4:	UVR	PWN	EFQ
AMC	TEQ	WN5:	PXZ	EGJ
AMR	TES	TEK	QDY	EGQ
ANL	TFB	TEL	QEC	EHL
AOC	TFL	TFM/8	QJI	EZN
AZP	TFR	TGH	QLH	EZT
BNS	TFX	TNH	UIY	EZU
BYY	TGT	TOO	WN8:	FBL
CJA	THI	TST	HHF	FCW
EEL	TIG	TVW	HIF	FFY
EZJ	TIU	TWB	HKZ	FGC
FRU	TIV	TWF	HOK	
IDK		TYV	HOM	

11 Meters a Good Novice Band. Novice Round-up reports are still coming in as we write. Many worked . . . states notations on QSLs will show an increased total as a result of the Round-up. Eleven meters was used to the advantage of certain participants to get the distant ARRL sections. Note just a few desirable ones:

Ala., WN4TJO; Ga., WN4TVN; Hawaii, WH6-AJT; Los Angeles, WN6ORB; Ohio, WN8HPF; San Diego, WN6NLO; Southern Texas, WN5-TWB; Virginia, WN4TZI. Try 11 for some WN DX.

How To Get Emergency Messages Through. The majority of amateurs are quick to accede to the principle of curtailing casual activity if it would cause interference to any emergency communications in progress. The degree to which an emergency is "generally recognized" as pertaining to communications service is important. Much depends on the duration of the primary load of emergency communications; also on the conditions in the later hours or secondary phase, and the judgment and operating savvy of the operators engaged.

There is a case for the low-powered emergency rigs in situations not backed up with wire and where those participating are subjected to interference from high-powered stations in casual QSO who cannot hear the work in an emergency zone. If the communications are of small scope, however, or the communication is plainly supplementary to wire and press facilities, many amateurs may rightly feel that those engaged should use good judgment to "button up" their contact, particularly if emergency traffic is not actually forthcoming. A circuit should not be held open unreasonably just because someone hopes he can get a place in the sun by getting unnecessarily into a situation already under control.

In such cases, and also in the emergency of larger scope, it is generally advisable for those primarily concerned in net operations to line up some stations to stand-by off the traffic frequency to watch for and QRX new casual operators who come on the channel being protected without being first aware what is going on. The conduct of the emergency-net operators themselves, in keeping their channel busy with traffic, all handled in businesslike fashion, and necessarily of a type self-identifying as to its emergency nature is a necessary prerequisite to securing the widest amateur understanding and automatic cooperation of all amateurs. To be understood quickly the emergency thus *best speaks for itself*. If this condition is truly satisfied there is generally no complaint about getting general amateur cooperation.

We do heartily recommend to radio amateurs stock-piling some rigs for low-powered circuits, to utilize v.h.f. and c.w., for frequencies less subject to congestion and interference. All amateurs are supposed to know the code anyway, so that instead of complaining to the world in general (FCC

and ARRL included) it becomes more the intelligent operating thing to do to side-step the QRM difficulty. To secure the greatest freedom in operation, plan and test in advance if possible with your group stations, so you have the ability to put your record communications over to less crowded c.w. or v.h.f. frequencies. This is sometimes the thing to do; it makes possible quiet efficient operations, and avoids contending with any large degree of misunderstanding and congestion. 'Tis the real communicator's way of exercising versatility to sidestep interference and see the message through. Strangely enough there are almost always alternate circuits and ways for the skilled man to do his communications job.

— F. E. H.

JANUARY CD QSO PARTIES

The January CD QSO Parties provided League appointees and officials with lively contest workouts. In the c.w. fray top score honors were earned by W7BSU of Montana, who apparently went all-out to bring the West into the CD Party limelight. Virginians W4KFC and W4IA, old and capable hands at this party business, took second and third places respectively. The mike boys were really in there pitching this time and came up with some good scores. North Carolina OPS W4NYN finished up with the highest 'phone score and a substantial lead on his competitors. Second-highest 'phone total was tallied by Mississippian W5DEJ, followed closely by W3HA of Eastern Pa. Listed below are other high claimed scores for the parties. The figures following each call indicate the claimed scores, number of contacts and number of ARRL sections worked. Final and complete results will appear in the April CD Bulletin.

C.W.

W7BSU.....	133,792-256-58	W6CMN.....	65,350-143-50
W4KFC.....	129,150-403-63	W7GHT.....	64,512-146-48
W4IA.....	113,460-365-61	W3KUN.....	63,920-266-47
W6LDR.....	106,095-211-55	W5AQE.....	63,000-219-56
W1EOB.....	87,910-291-59	W3BIP.....	62,230-237-51
W4HQN.....	85,260-287-58	W3JSH.....	60,580-226-52
W1ODW.....	77,000-290-55	W2EMW.....	59,535-237-49
W6WOO.....	76,388-161-52	W2COU.....	57,750-224-50
W3QLI.....	72,280-273-52	W8ZJM.....	55,640-209-52
VE1BK.....	72,165-240-51	W9RQM.....	55,620-200-54
W5DEJ.....	71,960-250-56	W7EMT.....	54,350-118-50
W3FQB.....	71,250-278-50	W6GEB.....	54,208-133-44
W2MHE.....	69,660-258-53	W2ATE.....	54,060-204-53
W8NOH.....	66,360-232-56	W2ZVW.....	52,500-223-50

'PHONE

W4NYN.....	10,230- 62-33	W2ICE.....	4995- 37-27
W5DEJ.....	6890- 46-26	W3KUN.....	4930- 40-21
W3HA.....	6885- 46-27	W3EAN.....	4140- 31-23
W2ATE.....	6750- 50-27	W9RQM.....	3900- 33-20
W2MHE.....	6600- 55-24	W9IFA.....	3800- 33-20
W4FV.....	5980- 41-26	W4KMS.....	3465- 33-21
W8ZJM.....	5520- 42-23	VE3BL.....	3330- 30-18
W1CRW.....	5040- 42-24	W2JXH.....	3100- 27-20

WIAW OPERATING SCHEDULE

(All Times Given are Eastern Standard Time)

Operating-Visiting hours:

Monday through Friday: 1500-0300 (following day)

Saturday: 1900-0230 (Sunday)

Sunday: 1500-2230

WIAW will be closed from 0300 April 11th to 1900 April 12th in observance of the Good Friday holiday, and from 0300 May 30th to 1900 May 31st in observance of the Memorial Day holiday.

General Operation: Refer to page 75, October, 1951, QST (see also page 73, December, 1951, QST) for a chart showing WIAW general operation. This schedule is still in effect and is not reproduced herewith for space considerations. Mimeographed complete master schedules of all WIAW operation in EST, CST, or PST are available upon request.

On Saturdays and Sundays during which official ARRL activities are being conducted, WIAW will forego general-contact schedules in favor of participation in the activity concerned.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules:

Frequencies:

C.W. — 1885, 3555, 7130, 14,100, 28,768, 52,000, 146,000 kc.

'Phone — 1885, 3950, 14,280, 28,768, 52,000, 146,000 kc.

Times:

Sunday through Friday, 2000 by c.w., 2100 by 'phone.

Monday through Saturday, 2330 by 'phone, 2400 by c.w.

Code-Proficiency Program: Practice transmissions are made on the above-listed c.w. frequencies, starting at 2130 daily. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately ten minutes of practice is given at each speed. Next certificate qualifying run from WIAW and W6TQD is scheduled for April 15th; from W6OWP, April 5th

MEET THE SCMs

Clifford C. McGuyer, W9DGA, SCM Indiana, received his first ham ticket in August, 1939, and since that time has been active in many phases of amateur radio.

He is an active appointee, holding Official Relay Station and Official Experimental Station appointments; also is past-secretary and present vice-president of the Tri-State Amateur Radio Society. An ardent contest participant,

he has taken part in ARRL Sweepstakes, DX Contests, and CD Parties. In addition, he possesses WAS, DXCC, Code Proficiency (35 w.p.m.), Rag Chewsers Club, A-1 Operator Club, and Brass Founders' League certificates.

The big rigs at W9DGA are a Signal Shifter driving p.p. 814s and 6F6-6F8-807 p.p.-810s for DX work. Also available are 6F6-6F8-2E26 for Field Day use and 6AG7-832 for v.h.f. Receivers are Howard 490

and 430, a homemade converter, and a 522. Antennas are a 99-foot center fed job, an 80-meter folded dipole, and a 10-meter vertical. For emergency use McGuyer has a mobile 29.6-Mc. Link police transmitter and receiver. While he operates on other ham bands, he is most active on 80-meter c.w. Cliff's favorite sports are baseball and football. Previously employed as a radio engineer at WEOA, he now is a radio operator for the Evansville Police Department.



A.R.R.L. ACTIVITIES CALENDAR

Apr. 5th: CP Qualifying Run — W6OWP

Apr. 12th-13th: CD QSO Party (c.w.)

Apr. 15th: CP Qualifying Run — WIAW, W6TQD

Apr. 19th-20th: CD QSO Party ('phone)

May 4th: CP Qualifying Run — W6OWP

May 14th: CP Qualifying Run — WIAW, W6TQD

June 6th: CP Qualifying Run — W6OWP

June 7th, 8th: V.H.F. Contest

June 19th: CP Qualifying Run — WIAW, W6TQD

June 21st-22nd: ARRL Field Day

July 12th: CP Qualifying Run — W6OWP

July 18th: CP Qualifying Run — WIAW, W6TQD

July 19th-20th: CD QSO Party (c.w.)

July 26th-27th: CD QSO Party ('phone)

Aug. 3rd: CP Qualifying Run — W6OWP

Aug. 18th: CP Qualifying Run — WIAW, W6TQD

TRAFFIC TOPICS

National Traffic System. Now under consideration to make your NTS a more efficient organization is a Transcontinental Corps (TCC) of crack operators interested in the long-haul aspects of traffic handling to assume full responsibility for relay of traffic between Area Nets. This will supersede the present system of inter-area liaison which has not worked as well as we hoped due primarily to difficulty in negotiating the long hop from Eastern to Pacific Area, and inability to find sufficient operators to maintain the late hours necessary to report into PAN from the East Coast. At this writing no manager has been selected for TCC, but negotiations are under way. Whoever gets the job will be interested in hearing from amateurs with top-notch traffic-operating ability, husky signals and ability or willingness to keep a late-evening or early-morning schedule. Several operators have already indicated their interest in the new high-level NTS group. If anyone else is interested just let us know and we'll refer you to the TCC Manager who will probably exist by the time this is printed.

One new Regional Net Manager who has never been properly introduced is Len, W8DSX. Len replaced W8SCW when the latter resigned to become Manager of EAN. This was mentioned in February QST, but faulty proofreading on the part of your reporter caused the call to come out wrong. Len usually operates from W8SG, the powerful station of Denison University.

January reports:

Net	Sessions	Traffic	High	Low	Average	Most Consistent
1RN	34*	254	35	0	7.5	E. Mass.
2RN	46	267	18	0	6	JN
3RN	39	175	40	0	5	E. Pa.
4RN	46	417	44	0	9	Fla.
RN5	36*	398	42	1	11	Ala.
RN6	46	673	57	1	15	—
RN7	54	430	29	0	7	Wash.
8RN	52	221	31	0	4	Mich.
9RN	27	486	57	2	18	All 100%
TEN	46	702	—	—	—	S. Dak., Ia., Mo.
TRN	50	119	13	0	4	Ont.
EAN	27	821	73	3	30	2RN
TLCN (Iowa)	23	269	29	3	12	—
QIN (Ind.)	77	780	38	0	10	—
NYS (N.Y.)	27	356	21	6	12	—

* Out of 46 sessions held.

Section nets who wish to report each month for tabulation in the above may do so by submitting the listed data before the fifteenth of the month. Convenient report forms will be sent on request to any net manager who wants to report the month's activity. This is for NTS section nets only.

Second Regional Net: The late session of 2RN has been discontinued because no section nets in that region are now holding a 2200 session. The 1830 session, previously experimental, is being continued.

Third Regional Net: During January, 11 different stations reported for Md.-Del.-D.C., 10 for W. Pa. and five for E. Pa. The consistency of section representatives was in just the opposite order.

Fourth Regional Net: Net Manager W4ANK requests volunteers for net control and liaison to EAN. The following have earned ARRL certificates: W4s AKC FPC ILJ IMH and OTE.

Fifth Regional Net: Several comparatively "new hams" are having a crack at the NCS job while some of the old-timers bolster CAN both as NCS and liaison.

Seventh Regional Net: Contact with Alaska is being maintained through separate schedules on 80 and 40 meters. Still no representation from Alberta or Saskatchewan. Eight RN7 members have been issued BRAT (Brotherhood of Radio Amateur Trafficers) cards by W7FIX.

Ninth Regional Net: 9RN certificates have been issued to W4SHJ, W9SFL, W9SXL and W0COZ.

Tenth Regional Net: W8SCA, in his last report as Manager, says "It has been a swell two years, and am almost sorry I resigned." TEN certificates have been issued to W4s CFL CXM EHO FQB GBJ KHQ KON VKB and ZLN.

Thirteenth Regional Net: TRN traffic hit a new high during January, with VE3ATR the star performer.

Eastern Area Net: During January EAN was in session 23 hours and 21 minutes, moving traffic at an average of one message each 1.7 minutes. 2RN was 100 per cent in attend-

ance, the other regional nets missing the Saturday night session most of the time. PAN liaison continues to be a problem.

Pacific Area Net: PAN is operative again with W7HKA as Acting Net Manager. The new regular net manager will be announced next month.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for January traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	251	2601	2266	314	5432
W6KYV	138	949	479	459	2025
W6CE	22	900	847	35	1804
W9JUL	39	708	640	16	1403
JA2KW	513	232	16	216	977
W8AUJ	10	495	343	128	976
W7IOQ	49	307	562	41	959
K4WAR	186	354	276	78	894
K7FAG	271	292	11	281	855
W6BAM	64	388	233	151	836
W6GYH	23	393	293	100	809
W7CZY	4	361	354	3	722
W0QXO	10	355	336	15	716
W8SCA	3	355	338	10	706
K6FAT	256	222	213	9	700
KL7AIZ	41	299	284	15	639
W5PXN	14	274	264	10	562
W1EMG	6	271	240	31	548
W4LMT	164	134	230	14	542
W4ANK	8	265	224	35	532
W2RUF	34	274	194	28	530
W9TT	23	241	227	38	529
W6BPT	5	259	248	9	521
W5PTV	46	254	200	10	510
W5MN	7	233	192	56	508
W5MRK	10	250	229	19	508
W6GEB	13	245	156	89	503
W9ESJ	21	191	241	50	503

Late Reports

W6BAM (Dec.)	68	1053	800	250	2171
W9FAE (Dec.)	62	380	354	28	831
W3NHI (Oct.)	17	348	279	35	679
W2BNC (Dec.)	12	260	247	19	544
W3NHI (Dec.)	4	274	175	80	533

The following made the BPL for 100 or more origination-plus-deliveries:

W20BU	259	K5FBB	162	Late Report	
W5FJF	226	W6WWT	136	W8CPB (Dec.)	171
W5PY	226	W7BA	111	W2TYC (Dec.)	135
W9NZZ	226	W6CMM	104		

A message total of 500 or more or 100 or more origination-plus-deliveries will put you in line for a place in the BPL. The Brass Pounders League is open to all operators who qualify for this monthly listing.

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Sections. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full member signatures be obtained, since on checking names against Headquarters files

with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested: (Signers will please add city and street address to facilitate checking membership.)

Communications Manager, ARRL [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the
..... ARRL Section of the
Division, hereby nominate
as candidate for Section Communications Manager for this
Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
Manitoba*	Apr. 1, 1952	A. W. Morley	June 15, 1952
Nevada	Apr. 1, 1952	Carroll W. Short, Jr.	June 15, 1952
Virginia	Apr. 1, 1952	H. Edgar Lindauer	June 15, 1952
Eastern Mass.	Apr. 1, 1952	Frank L. Baker, Jr.	June 15, 1952
Ontario*	Apr. 1, 1952	G. Eric Farquhar	June 15, 1952
Idaho	Apr. 1, 1952	Alan K. Ross	June 17, 1952
Yukon*	Apr. 15, 1952	W. R. Williamson	Mar. 17, 1949
Tennessee	Apr. 15, 1952	D. G. Stewart	Mar. 31, 1952
Arizona	Apr. 15, 1952	Jim Kennedy	Apr. 1, 1952
Connecticut	Apr. 15, 1952	Walter L. Glover	Apr. 14, 1952
San Francisco	Apr. 15, 1952	R. F. Cseikowitz	Apr. 14, 1952
San Joaquin Valley	Apr. 15, 1952	E. Howard Hale	Apr. 15, 1952
Northern New Jersey	May 15, 1952	Thomas J. Ryan, Jr.	July 26, 1952
New Hampshire	June 2, 1952	Norman A. Chapman	Aug. 15, 1952
West Indies	June 2, 1952	William Werner	Aug. 15, 1952
Arkansas	June 2, 1952	Dr. John L. Stockton	Aug. 16, 1952

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid such petitions must be filed with him on or before the closing dates named.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed in a number of Sections, as provided in our Constitution and By-Laws, electing the following officials, the term of office starting on the date given.

Illinois	H. F. Lund, W9KQL	Dec. 14, 1951
Alabama	Dr. Arthur W. Woods, W4GJW	Dec. 14, 1951
Alaska	Glen Jefferson, KL7NT	Jan. 15, 1952
Utah	Floyd L. Hinshaw, W7UTM	Feb. 18, 1952
Washington	Laurence Sebring, W7CZY	Mar. 10, 1952

In the West Virginia Section of the Roanoke Division, Mr. John T. Steele, W8MCR, Mr. Donald B. Morris, W8JM, and Mr. Alfred R. Dimmack, W8BWK, were nominated. Mr. Steele received 57 votes, Mr. Morris received 40 votes, and Mr. Dimmack received 28 votes. Mr. Steele's term of office began Feb. 15, 1952.

VE3BUR has only had a ticket since 1948, but he is RM, Asst. SCM, ORS and holds a 35-w.p.m. certificate, RCC, A-1 Operator, Public Service certificate and membership certificates in Ontario Section Net, Thirtieth Regional Net (of which he is manager) and Eastern Area Net. He also operates into Hit & Bounce and Michigan QMN Nets. Walt has filled six ARRL logbooks, never missed a CD Party, SS, LO Party or Field Day since becoming an amateur. He is on the Executive Board of the Frontier Radio Assn. and is past president and bulletin editor. On top of all that, Walt is one swell guy!

NATIONAL CALLING AND EMERGENCY FREQUENCIES

C. W.

'PHONE

7100 kc. (day)	3875 kc.
3550 kc. (night)	14,225 kc.
14,050 kc.	29,640 kc.
28,100 kc.	

During periods of communications emergency these channels will be monitored by stations of the National Emergency Net for personal-inquiry traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3535, 7050, 14,060; 'phone — 3815, 14,160 kc., 28,250 kc.

CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW/W0TQD will be made on April 15th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters. Frequencies of transmission from W1AW will be 1885, 3555, 7130, 14,100, 28,060, 52,000 and 146,000 kc. W0TQD will transmit on 3534 kc. The next qualifying run from W0WOP only will be transmitted on April 5th at 2100 PST on 3590 and 7248 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the five speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST. References to texts used on several of the transmissions are given below.

Date	Subject of Practice Text from February QST
April 2nd:	Painless Shielding for the Plug-in Coil Transmitter-Exciter, p. 10
April 4th:	A Radio-Control System for Mobiles, p. 17
April 8th:	TVI Went Thataway! . . . , p. 20
April 10th:	A Battery-Operated 8-Meter Portable, p. 25
April 14th:	How To Wire a Transmitter, p. 30
April 16th:	The Wavelength Factor, p. 40
April 22nd:	Fundamental Teletypewriter Operation, p. 45
April 24th:	The World Above 50 Mc., p. 48
April 28th:	A Mobile Installation . . . , p. 54





In sorting through the somewhat considerable amount of material submitted for "With the AREC" this month, it occurs to us that there are a few ways in which you fellows who send in this material (bless your hearts) can help us to present it in *QST* in a more thorough and concise fashion. Mind you, we are not complaining, but only assuming that you want to do the job right in setting down these points on how to do it right: (1) Include all the clippings which contain mention of the amateurs' part in the emergency. (2) Be specific as to dates and times. A reference to an emergency "night before last" can be very confusing. (3) If you yourself participated, give a résumé of your version of the activity in addition to any clippings you send in. We don't like to reconstruct a story of amateur participation from newspaper clippings alone, since they are often inaccurate and always written from a different point of view from ours. (4) Photographs are important, and unposed action photographs are the best. We are not much interested in bigwig officials standing around watching — we are most interested in the amateurs doing the operating and the equipment they are doing it with.

Your consideration for some of these factors in reporting amateur participation in emergency communication will be much appreciated by your very busy Headquarters staff.

The freak storm of January 15th-16th hit Milwaukee with heavy rains, an unseasonable thaw, pea-soup fog, lightning, and gusty winds up to 51 m.p.h. to bring action by the mobile wing of the Milwaukee Radio Amateurs Club. On the discontinuance of telephone service in parts of northern suburbs, W9SNK rounded up net members and the amateurs soon established an effective net of mobiles and fixed stations at various police and fire stations under the direction of W9GPI.

Police officials expressed delight at the speed with which the amateurs set up the net. The Milwaukee Journal gave the hams front-page notice in their write-up of the storm's fury. We're mighty proud of the following mobileers who participated: W9S DIJ FY MOT FDX ONY NMA and DR. W9KZQ stood by with his transmitter. — W9PXA

At 0902 December 4th, W7HDN was called by W7EJF and advised that power was off in Coos Bay. With the assistance of W7WJ and W7DAF a circuit was set up immediately for handling traffic as there was no communication out of Coos Bay and adjacent areas. W7EHW was able to pass on an eye-witness account of the damage, which proved the situation to be serious, before he lost his power. Several other stations checked in and at 1050 W7HWX/M advised that power and 'phone lines were out in Reedsport. At 1128 W7KYU advised that he was using

emergency power. W7HNR/M reported no apparent damage in Tillamook Bay. At 1215 W7EJF advised his power was on but he had a generator available if he lost it again. W7HWX came on with emergency power.

This was the sequence of events on the evening of December 4th in the general vicinity of Coos Bay, Ore. By midnight traffic was picking up at a rapid rate and Western Union and the Telephone Company referred much of it to the hams. Broadcast station KGW requested an on-the-spot report for their newscast. Arrangements were made from W7APF at Empire through W7II and his 'phone patch. This was broadcast on "News of the World" on NBC. Operations continued for three days, by which time some 'phone lines were re-established.

Some of the additional services performed by amateurs during this period, and some of the notable events, were the following: (1) A Southern Pacific train became lost because of lack of communication. W7LVN/M located it about four miles from Astoria, unable to proceed. He established communication between the train and Eugene. Along with W7HWX and W7MHV, SP train orders were handled with W7KL at Eugene. (2) Considerable business was handled for West Coast Telephone Company from Coos Bay to their headquarters in Everett, Wash. KL7TM/7, W7JFB, W7EVI and W7IOQ were on the northern end of the link. (3) W6CXO was not available to take over NCS during skip conditions, so W6WGO moved in and did a notable job under very adverse conditions. (4) W7EJF and W7APF shared the NCS job, with W7LXW as relief. (5) W7AWI assisted in getting communication into Crescent City, Calif. (6) Several calls were handled for the Oregon State Police.

Among the agencies served were three press associations, three newspapers, four broadcast stations, Western Union, Pacific Telephone & Telegraph Company, West Coast Telephone Company, U. S. Weather Bureau, U. S. Engineers, Southern Pacific Railroad, Oregon State Police, General Adjustment Bureau and other insurance agencies, Greyhound State Lines, West Coast Airlines, Coos Bay Lumber Co. and the American Red Cross. Traffic included requests for food, drugs, and auto parts, and death messages, health and welfare messages, State Police advisory traffic and calls for police assistance.

Stations principally involved were W7s EJJ HWX HDN AIZ KYU APF KL LVN POM HLF FRT LXW AEF and MHV. Other stations assisting included W6s WGO JDN. W7s KTG JFB WJ BA HHH/GNJ II PKG IRJ HJU AWI FL ETX NOJ OIE and KL7TM/7. This list is probably incomplete. — W7HDN, SEC Oregon

SEC W6KSX of the Los Angeles Section reports activity by two nets in the recent flood and snowstorm emergency in the Los Angeles Area. In the Owens Valley Area of California a telephone line failure gave the newly-formed Owens Valley Emergency Net a chance to demonstrate its ability. W6WWT, manager of the net, handled 260 messages in six days and there was communication out of Bishop within one hour after the lines were reported down. The net was on 24 hours a day until lines were available again. The Mission Trail Net helped in relaying traffic including weather reports, Western Union telegrams, orders for equipment for the telephone company and traffic concerning a near-by Marine encampment which was snowed in. A good impression was made on the local populace and civil defense officials.

On January 17th, after continued heavy rainfall in the Los Angeles Area, civil defense officials notified W6KEI that 30 families were in danger of isolation in the Tujunga

On January 31st, the Omaha (Nebr.) AREC gang assisted in the March of Dimes "Lights On" drive. This control station, on the third floor of the City Hall, kept in touch with 10 mobiles which were deployed about the city collecting contributions from citizens who left their porch lights on, or to pick up an "area captain" with money which he had already collected. That's W0JKE at the mike, with a city official watching with interest.

♦
♦
QST for



Canyon and that they were in need of communications to go in the rescue convoy. Alerting the Golden State Emergency Net, within 20 minutes W6s QNN OLO VFG and SRJ were on their way. W6SCN also started out, but his mobile was drowned by high water. Contact was established and maintained between the convoy and headquarters. Power stayed on, but telephone lines were overloaded. Amateur radio stations checked in from all areas, reporting on conditions and water levels and roads that might still be passable. Routes were laid out and road conditions relayed to defense plants whose workers were waiting to go home. Much goodwill was gained, and civil defense officials were happy with the results. Some of the participants were W6s QVN OLO VFG SRJ SCN TDW UP NCN HK LCY PRB BZF FMG PIB GDT UWM CG FJW WZS WXS LUG UIF BKS PJ and SCQ. Says EC W6KEI: "It is one thing to have a Field Day in summer when the weather is FB, but something else to operate mobile with water over the floor boards and six inches deep in your shack. To all, thanks for a job well done."

An ice storm in the first few days of January left the little town of Crockett, Texas, entirely without communication for two days. W5FNQ, with the assistance of W5FWS, handled all communication to and from Crockett for two days. Assisting on the "outside" were W5s SQW JQD PTK PXI FNH and CC. The telephone company got a wire open the night of the 5th and normal communication was restored.

Four amateurs set up a circuit which may have prevented serious mishaps on the Santa Fe Railroad between Williams and Flagstaff, Ariz., when high winds, sleet and ice disrupted signal communications, leaving six passenger trains without contact with the division dispatchers in Winslow. W7OJQ who, with W7LYS and W7KQV, soon established contact with W7RU at Williams. W7LYS started on 160 'phone and W7RU on 75-meter 'phone; but QRM was so bad that W7LYS opened up on 80-meter c.w. and all messages got through in good shape. Orders and instructions between the two points continued for several hours before a regular telegraph line was patched together. Naturally, railroad officials were very highly pleased with the work of the amateurs.

Late in the evening of January 2nd, ice started forming on wires and trees in the southeast part of Missouri and southern Illinois. By the morning of January 3rd, approximately 20 towns in this section were without power or communications. W9PTG was in full swing with a battery-powered rig early Wednesday morning and had established contact with Memphis, Tennessee, St. Louis, Perryville and Columbia, Mo. W4BAQ at Memphis and W0IQY in St. Louis were active. By Wednesday night most of the Missouri Emergency Net could be heard handling traffic and clearing the frequency for the lower-powered transmitters. On January 5th, W9MTB offered the loan of a 3000-watt a.c. generator belonging to the Bluff Amateur Radio Society. This plant was put in service Sunday afternoon at Wyatt, Mo. Power and telephones were out for a total of 11 days.

Amateur radio played a big part in obtaining power plants from scattered points in Missouri. The REA, Red Cross, newspapers and State Police were aided by numerous amateur stations in the isolated towns. It is impossible to identify all the stations taking part, but some of the known calls were W4s NEP BAQ and JLI; W6s PTG QMF IQY CPI EXN MJT MTB ABY RMX LBM EKW and W9BMV. — W9PTG, EC Wyatt, Missouri

We acknowledge receipt of reports from ten SECs for the month of January. This is not a good showing, and the results are hardly worth tabulating. Every EC should report to his SEC every month on a Form 5 card, and every SEC should report to Headquarters (via his SCM) every month. These are monthly progress reports, and they are important. Copy for this column goes in before copy for "Station Activities," and SEC reports usually come along with the SCMs' reports, so we'll report January again next month, and continue a month behind to make sure all reports are included.

How about it fellows? Do something at your local level so your EC will have something to report to your SEC, so the SEC will have something to report to his SCM and HQ. Let's show some progress climbing toward 100%!

BRIEF

"It is noted from a paper by R. L. Smith-Rose, Fellow, IRE, in *Proc. I.R.E.*, p. 16, January, 1950, that speed of transmission of radio waves varies with practical conditions so that at 100 kc. with propagation at heights of fractional wavelengths the speed is 299,250 kilometers per second while centimeter waves propagated at heights of several wavelengths are observed to travel at approximately 299,690 kilometers per second.

"This suggests that a remedy for the three- and four-day delays frequently encountered in semi-local traffic handling might well be found in higher antennae and transmission frequencies. Thus traffic nets might give consideration for removal to channels at high ends of bands used. Priority traffic could of course be handled by mobile aircraft where, at altitudes of 9800 meters, velocities at centimeter wavelengths on the order of 299,750 kilometers per second may be anticipated." — W5DCP

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....246	W6ENV.....235	W2BXA.....230
W8HGW.....241	C2PL.....235	W3KT.....229
W3BES.....241	W3CPV.....233	W3JTC.....229
W6VFR.....238	W3GHD.....231	W6GRL.....229
W0YXO.....237	W6AM.....231	W3EVW.....228

RADIOTELEPHONE

W1FH.....215	XE1AC.....208	W1JCX.....192
PY2CK.....211	W8HGW.....198	W2BXA.....188
VQ4ERR.....209	W9RBI.....195	W3LTU.....187
	WINWO.....193	

From January 15 to February 15, 1952, DXCC certificates and endorsements based on postcard contacts with 100-or-more countries have been issued to the amateurs listed below.

NEW MEMBERS

ZS6BJ.....116	F9FF.....106	CX6AD.....102
YV5BZ.....116	SM5AQV.....105	VE6MN.....101
F9KQ.....112	W6GYL.....104	W8YIN.....101
G5PQ.....109	F9DN.....104	PA6FD.....101
F9FY.....108	W9RYK.....104	W8FID.....101
I1RY.....106	PY1ADA.....104	W8SKU.....100
W3HTO.....106	W9JUV.....103	PA6ZL.....100

RADIOTELEPHONE

CX4CS.....128	W2PBG.....102	W4EYG.....100
CX3BH.....103	I1BPW.....102	W2TXB.....100
F9PH.....103	W4DEO.....101	

ENDORSEMENTS

W6SYG.....222	G6YQ.....181	W6VOE.....131
W8BRA.....221	W5ADZ.....179	W5FXN.....130
CE3AG.....220	W4CYY.....175	W3MZE.....130
W6DZZ.....220	W8DAW.....171	EA9AL.....130
W9ANT.....216	W1MB.....170	W8UPN.....129
W3OCU.....211	PY7WS.....170	W6NZ.....126
W3EPV.....210	W5JUF.....165	W2UWD.....126
W4NHN.....206	W2LSX.....162	W8CED.....125
W5ENE.....203	W7DET.....160	954AX.....125
W5MIS.....203	W5FFW.....160	Z86OV.....122
W5JC.....200	W5LGS.....160	W5LV.....121
W5KUC.....194	W9ABA.....160	W0AIH.....120
W9FKC.....192	W3NMA.....153	PY4RJ.....117
W3JKO.....190	IS1AHK.....150	W1LQ.....116
W4OM.....190	G3BKF.....150	G3AJP.....114
W3LTU.....190	W5NW.....140	VE1EK.....114
W1AXA.....186	W1CJW.....133	I1PG.....111
W5BGP.....181	G5VQ.....133	W3MDE.....110
	W2PBG.....132	

RADIOTELEPHONE

W5BGP.....180	W6KQV.....150	W1CJW.....125
W1MB.....170	W5NMA.....144	W9NLP.....121
W8BF.....170	W1EKU.....140	VE1CR.....120
W4AZD.....160	YV5AB.....140	PY4RJ.....116
I1SM.....160	W1FFO.....131	ON4YI.....110
W4ESP.....150	W1MMV.....130	W3BUX.....110

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, John H. DuBois, W3BXE—SEC, ISE, RM: AXA, BIP, E. Pa. Net: 3610 kc. The following clubs held elections during January: Northeast (Phila.), IND, pres.; KYX, vice-pres.; RZO, secy.; DYL, treas. Phila. Wireless Assn., DFL, pres.; MWC, vice-pres.; RNF, rec. secy.; QLI, corr. secy.; QEZ, treas.; JWC, membership. Phil-Mont (W. Phila.), QQH, pres.; IM, vice-pres.; NIF, secy.; QOI, treas.; PKY, program. York ARC, DJF, pres.; HYH, vice-pres.; RGN, secy.; IXG, asst. secy.; EDO, treas. Frankford (Phila.), CTJ, pres.; EQA, vice-pres.; IXN, secy.-treas.; BES, act. mgr. The Abington Township Club has started preparations for FD rigs as a club project. A new radio-equipped trailer soon will be put into operation by the Phil-Mont Mobile Club under the call KQZ. York Emergency Net drills have been changed to 2200 EST. Mondays. Ruckers indicate a high percentage of Eastern Pennsylvania activity in the CD Party and V.H.F. SS. OOs comment on increasing keying troubles and spurious radiations during recent months. OQG has left for the Army. OSE is on 3.5-Mc. c.w. from his dormitory at Lehigh Univ. RCE has a new QTH in Willow Grove and PSI and QV are sporting new rigs on 80 through 10 meters. BES received his DXCC 180 sticker on 'phone. SNY changed his call from "WN" in four months. QV has accepted the post as TVI Committee Coordinator for the Philadelphia Area. All EC endorsements will have been issued by March 1st. Comments regarding the proposed 7-Mc. 'phone sub-allocation would be appreciated. Some of the WN stations are having technical difficulties and a helping hand from some "old timers" would be more than welcome. Traffic: (Jan.) W3CUL 5432, NHI 438, BIP 237, AD 107, LQV 96, QEW 74, AXA 62, OML 59, ADE 43, PDJ 36, VR 18, QZL 17, ELI 11, UKI 8, CAU 5, BXE 2, HA 2, BES 1. (Dec.) W3NHI 533, CPV 8. (Oct.) W3NHI 679.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, James W. John, W3OMN—The Capitol Suburban Radio Club elected the following officers for 1952: NOL, pres.; KAN, vice-pres. and recording secy.; IZL, treas. The Club meets the 1st and 3rd Fridays of each month. Amateurs in Prince George County can obtain details on meetings from KAN. The Washington Radio Club held a well-attended Valentine Dinner on Feb. 9th for the area amateurs at the Hotel 2400 in the D. C. Harold Richman, 4CIZ, of FCC, discussed TVI problems and their solutions. On Jan. 11th the WRC programmed a movie "Cross Country Micro-Wave Relay for TV." An auction was held Jan. 25th. Novice meetings precede the regular meetings. Information for those interested is obtainable from Ethel Smith, MSU. On Jan. 15th the Chesapeake Amateur Radio Club president BIL H. E. Wootton, president of Maryland Mobile Club, speak on mobile radio. On Feb. 5th films on c.d. and jet propulsion were shown. On Jan. 21st the Baltimore Amateur Radio Communications Society discussed "Using the Surplus Meter." The agenda for Feb. 4th included a talk on beam antennas by NJJ, Cecil L. Wilson. An auction followed the meeting. Regular meetings are held the 1st and 3rd Mondays by the BARCS at 23rd and St. Paul Sts., Baltimore, Md. On Jan. 11th the Rock Creek Amateur Radio Assn. discussed TVI, and on Jan. 25th Dr. Eschenbrenner, of Public Health Institute, described the Bikini Tests. The Maryland Emergency 'Phone Net meets on 3820 kc. on Mon., Wed., and Fri. at 6:30 p.m. and all other days of the week at 1:00 p.m. KAV, of Cumberland, was elected net communications manager. TT, FRY, and KCQ are net directors. Non-number 73-meter stations are invited to call into the Net at the conclusion of the regular roll call. 3LQK is operating in Greenland under the calls OX3BI and OX3BF. WN3RXS and WN3RXU, father and son, respectively, are operating at Salisbury, Md. More than 400 contacts have been made by them in the last six months on 3.5 and 144 Mc. QNE now is 28 and 144 Mc. PFF moved to Chicago. 2CZD is on 28 Mc. as 3CZD. 0DQQ now is 3TCY. 3PRT received a Public Service certificate for his Kansas City Flood work. Traffic: W3LZM

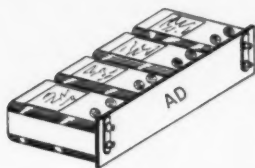
223, QZC 52, PZW 35, NOE 29, FWP 22, AKB 19, JZY 18, MCD 18, QNB 18, CQS 15, TT 9, JHW 8, MCG 8, COK 3, NNX 2, PRT 2.

SOUTHERN NEW JERSEY—SCM, Lloyd L. Gainey, W2UCV—Emergency Net operations in South Jersey are on the upswing, aided considerably by the FCC announcement of the proposed RACES amendment to our operating rules. A drive has been started to have local municipalities purchase 12- and 10-meter antennas and coaxial feedlines. These will normally be installed on the building chosen as control centers in time of emergency. The Delaware Township Civil Defense Council has started the ball rolling with its recent purchase of such equipment. The Camden County 2-meter emergency net on 145.4 Mc. meets mobile at 7:30 p.m. the 1st and 3rd Thurs. of each month; meets fixed station at 7:30 p.m. the 2nd and 4th Wed. of each month. Newcomers are welcome to call in. See 2UCV for appropriate crystals. The SJRA v.h.f. enthusiasts went all out for the recent contest. While there was no major band opening, a few of the elusive sections were snagged, accounting for many individual high scores. What local ham drove into a minute-car-wash with 10-meter whip intact—drove out of minute-car-wash—10-meter whip pretzel-shaped and bent up—car-wash man—car-wash man. "I'll wash the car myself! 2ZL activated the NJCD Net during the airplane disaster in Elizabeth to provide radio contact from scene to c.d. headquarters in Trenton. K2AT gave a very interesting exhibition to members of the Hamilton Township Radio Assn. of practical transmissions in the micro-micro-microwave region. Traffic: W2ZBW 129, K2BG 74, W2ZBW 129, LTI 52, ASG 32, ZF 2.

WESTERN NEW YORK—SCM, Edward G. Graf, W2SJV—SEC: UTH, RM: RUF and COU. NYS: 3615 kc., 7 P.M. NYS: 3595 kc., 8 P.M. NYS: c.d. c.w. 3509.5 kc., Sun. 9 A.M., Mon., Wed., Fri. 7:30 P.M.; 3970 kc., Sun. 9 A.M., Mon. through Fri. 6:30 P.M. Please note time and frequency change of NYS, KBT manager. On Feb. 9th the NYS held its 5th Anniversary. The Emergency Net was organized by SAG, with the assistance of ITX. Charter members of NYS were AOR, BVR, ITX, LRW, NKK, NHY, PGT, QOM, QZL, RIZ, RUF, and SAG. Congratulations to all NYS members for keeping the net in operation continuously over the years and best wishes for a successful future. GTI was named the "Man of the Year" of insurance men by the Junior Chamber of Commerce. COU has appointed RM for ZRN. SFW is on 144 Mc. with crystal-controlled rig and converter, and is experimenting on 420 Mc. K2DQ has Viking on 28 Mc. QYT built new receiver for 144 Mc. ICE has new 1(7)-kw. rig on the air. POT has been issued the new call ATX. TBD, UDD, SJV, and SSS attended the Rochester v.h.f. meeting in December where TBD outlined the c.d. set-up in Erie County. QY is active in OO work. Rowland Stubbs spoke on Transformer Design at a KBT meeting. RUF and her OM enjoyed New Year's Eve in VE3-Land. TQ is C.D. Zone 6 Coordinator. SHGU, TDB, SJV, SSS, PPY, WDX, ZRC, UDD, QNA, HNN, UTH, and OWF attended the South Ont. and W.N.Y. v.h.f. meeting at Oakville, where SHGU spoke on receivers for 420 Mc. Carl Wendt, of Sylvania, gave an illustrated talk on color TV at RAWNY. FE's average error in p/m in the November FMT was 4. RXW is chief of c.d. communications in Madison County. WN2KLJ gets on 3.5 Mc. after feeding the jr. operator at 4 A.M. GSL operated 10-meter mobile from plane crash vicinity near Salamanca. FHS finds time to pound brass between QSOs on 75 meters. ARK is on from Geneseo. GRH works the West Coast regularly. SAG is active on 144 Mc. From Morris, N.Y., AFQ snagged a VQI. QY and UXF put up a new 2-meter antenna for BCL upon his release from the hospital. ZUR moved to the Rochester Area. The XYL of ICE presented him with a jr. operator. It is with regret that I report the passing to Silent Key of UDD. DPL is back on 3.5 Mc. QNA is trying a 4/4 on 144 Mc. QBY is using clamp-tube modulation on ARC-5. SMM is working near Canajoharie until TVI is cleaned up in the rig at Nunda. RSR is active on 3.5 Mc. SGJ has a 75A-1 receiver. A new radio club has been formed in Nunda. Contact GRH for details. Traffic: (Jan.) W2RUF 530, NAI 213, BTB 163, COU 140, DJF 133, OE 114, ZOL 98, RUT 77, SJV 57, PGT 30, VIQ 27, FCG 26, K2DQ 13, W2EAW 7, RXW 6, DPL 4. (Dec.) W2RUF 291, ZOI 214, NAI 160, ZI 33.

WESTERN PENNSYLVANIA—SCM, Ernest J. Hinsky, W3KWL—Your SCM urges each and every Novice reading this column to send a report. From up Erie way, QN sends in newspaper clippings of his club activities. It is with regret that we record the passing of an old-timer, Miles Wade Hopkins, SAHE, BKM and MMH are working 28 Mc. we are told. The eighth of RXW now is a member of the WAF, LKJ and KNQ gave the local Boy Scouts a real demonstration of radio communication. Contacts were

(Continued on page 78)



HERE is good news for the thousands who own HRO-50 and HRO-50-1 receivers. Now you can extend the range of your receiver to six meters without any changes. Merely purchase the new 6-meter "AD" coil, plug it in, and you're in business on six!

With the advent of civilian defense, many communities have established networks on six meters and interest in the band is increasing daily. Now that the HRO-50 can be used for C-D work on six meters as well as on the lower frequencies in normal C-D use, we hope the new 6-meter coil will enable many HRO owners to take part in their local civil defense nets. We also hope that it will be the means to enable thorough utilization of the possibilities of this relatively unpopulated 4 megacycles.

Engineering foresight in the planning of the HRO-50 and 50-1, together with the use of high quality ceramic parts in the front end of the receiver makes such a coil possible, with a high degree of performance to be expected. The sensitivity is in the order of 2 microvolts for a 10db S/N ratio and the image ratio is approximately 25 db (5 "S" units). For optimum results, a good six meter antenna (preferably a beam) should be used.

Here is an example of how the demands of hams over a period of time do register with the manufacturer, since he wants to make available those things that are in demand. Here, also, is the main reason for not changing the basic design of the HRO, since it is the only receiver in our line, and in any line we know of, for that matter, to which a new coil can be added at any time there is sufficient interest — and the receiver *can be made direct reading on the new frequencies covered*. This is quite an accomplishment when you recall that there are now 13 coils that can be purchased with the HRO-50-1, taking its range from 50 kc. to 35 mc. and from 48 mc. to 54 mc. This means that changing frequency assignments at any time could not obsolete an HRO.

Forgive us for our boyish enthusiasm, but the HRO is one subject we get wound up on. Oh yes, the cost of the new coil is \$24.50. Order it thru your National distributor. (No extra charge for the lucite scale that makes your HRO-50 or 50-1 direct reading on six meters.)

W. W. BARTELL, W1PIJ



With ELDICO the BLIND



BOB GUNDERSON, Editor of the Braille Technical Press and Electronic Designer for Blind Hams, demonstrates his meterless roll-ohmmeter to Viola Grossman (left) and Don Merten at testimonial luncheon given him by the Kiwanis Club of Bayside, at which the Eldico "Help the Blind See Ham Radio" program was inaugurated.

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ELDICO has long ago established its policy for the Hams... more active Hams... for the good of amateur radio... now and in the future. In keeping with this policy ELDICO designed a line of amateur equipment, in kit form, equal to or better than existing high cost equipment, and made these economical kits available to all by keeping the price down and quality up.

When TVI raised its ugly head, ELDICO's Engineering Staff dug in and came up with the information, tools and needed test equipment, low enough in cost for all to have but equal to high priced units in performance. Because of ELDICO, Hams who would have been QRT are now on the air.

The Private Tutor Course was designed to further advance

interest in amateur radio. The FCC provided the opportunity and ELDICO provided the means to become a novice. The ELDICO Private Tutor Course, code in long playing Columbia records and theory in Braille, was presented to the famous Bob Gunderson, W2JIO for use at the New York Institute for the education of the Blind. This has been so successful that the ELDICO program is being extended so that any blind person desiring to become an amateur can do so without cost. Full details can be obtained directly from ELDICO, from any ELDICO distributor or in the April issue of the "Braille Technical Press."

The Private Tutor Course is on sale at all ELDICO distributors: Five long playing Columbia records for code training (a full five hours of playing time), six complete lessons covering Novice theory with examination for each. Copy of the ARRL License Manual. Construction courses for test equipment, transmitter, resistor and impedance calculators, etc. See the Private Tutor Novice Course at your dealer's now.

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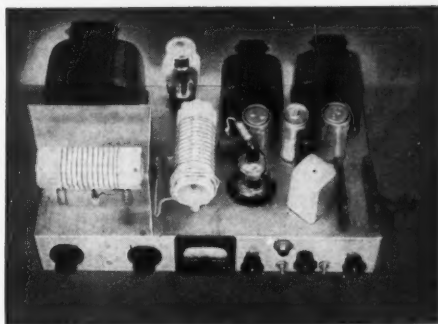
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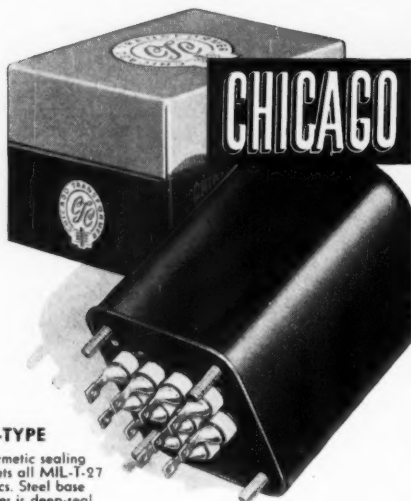
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(Continued from page 74)
made with QZE, OIE, NXX, and PIY during the demonstration. OIH is pleased with his mile rig. KJMG, formerly of Pittsburgh, made his debut on 7-Mc. c.w. at his new QTH. ODF and NXX were responsible for obtaining through ham radio for the Erie Dispatch news of the fatal plane crash in New York recently. GSL, a former member of the RAE of Erie, reported his eye-witness account of the conditions and rescue operations via PIX. Other amateurs who participated in the plane hunt were BRC, KSJ, OAD, PIX, PIY, MS, OIE, and mobiles 2GSL, 2ABC, and 3HUL. The Warren Radio Club has such active members as PMY, acting secretary. SQL, the 13-year-old member, LFV, NQA, PHC, KYW, BOZ, OMK, MWR, RJJ, LRE, TOJ, RMM, and NAQ. Down Pittsburgh way, the Steel City Amateur Radio Club sends in its club paper, *Kidovolt Harmonica*. Please note that the PARCC is being revamped and called the Western Pennsylvania Area Radio Club Council. KWH, under the operating ability of NWD, is mowing 'em down on 75 meters. TVB received his DXCC certificate. QXZ finds that his BC-459A sure plays heck with TVL. NRQ and MPO are in the civil defense nets on Sundays at 9:00 a.m. on 3920 kc. PAF is returning from Korea. APH, we understand, is the only active station on 75-meter 'phone from down Jeannette way. In Johnstown, QYK has applied for EC work. KOF has moved to Cleveland. Another new Novice in Pittsburgh is WN3SDV, who reports he has worked 14 states on 3.5 Mc. ODU reports he did manage to work in the CD Party. Donora's contribution to ham radio is WN3SKH. OEZ now is Class A. Heard in the recent V.H.F. Contest were RUE, NKM, and KWH. The Mercer County Radio Assn. is proud to announce that George Heim, treasurer, now is WN3SYZ. In spite of George's handicap of total blindness he is working very diligently for his General Class ticket. WN3SKF, from Greenville, will have a 32-element 2 meters soon. The Pennsylvania/Ohio 2-Meter Net now operates each night at 6:30 p.m. Traffic: (Jan.) W3GEG 218, NCD 87, UHN 32, KUN 30, GJY 12, KWL 10, VNL 8, MIZ 2. (Dec.) W3GEG 239.

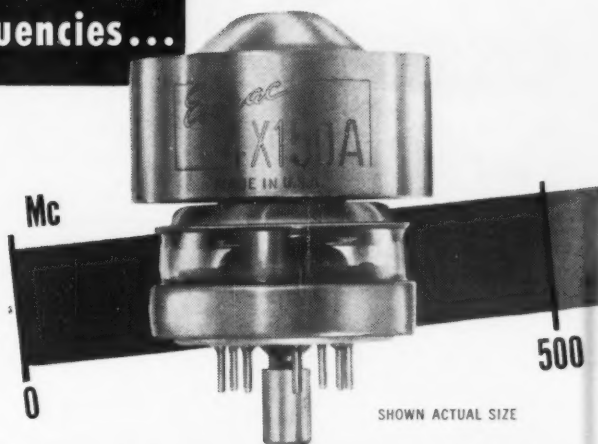
CENTRAL DIVISION

ILLINOIS — SCM, H. F. Lund, W9KQL — Section Nets: ILEN, 3940 kc.; ILN 3515 kc. SEC: QLZ. Asst. SEC: HPG. PAM: UQT. RM: BUK. ILN changed starting time to 1900 CST Mon. through Fri. EBX spends most of his time as NCS on TXN. OCG is doing good work with 30 watts to a 6V6 and has 3-tube regenerative receiver. ICF got confirmation from country No. 76 on 28-Mc. 'phone. PEC skeds PED/9, who is at the University of Colorado. MBI completed work on his 434-Mc. crystal-controlled converter. YXX has returned to the air and is on 3.5-Mc. c.w. and 4-Mc. 'phone. UAZ, vacationing in Miami, advises that the beach sights interfere with mobile operation. RPL has been relicensed under the same call. STZ maintains daily sskd with his son, PTZ, at Ripon College. CBZ has taken delivery on a 75A-2. Mr. W. F. McDonald, FCC Regional Manager, spoke on National Defense before the Wheaton Area, York, and Rock River Radio Clubs. He got iced-in at Dixon and spent the night with AND. The Freeport Radio Club now meets twice a month. LQI and JSP also vacationed in Florida. CKM is back on c.w. after a bit of 'phone. VJN operates 7-Mc. c.w. The Joliet Club did an excellent job in 1951 with its code class. As a result of its efforts new General licensees are OGC, OFR, PHN, QHY, QLB, and QYK, and Novices are OKM, QAK, QPG, QPH, and PDM. LCG received Advanced Class license and completed work on an 814 final. BVY couldn't load his transmitter until he put in a new meter—the old one was only reading half-scale. OTM dropped the "N" from her call with a General Class ticket. JVI doesn't like Korea since hamming was declared taboo. IFA has 2E26 final and Hylite beam on 144 Mc. CARC officers are MTW, chairman. JMG, vice-chairman; AVH, secy.; KCW, treas. KCX is new OPS. QLK is a new Novice in Elgin. K9AAJ is operating mobile in the Dixon Area. DXT worked with OQI to make him a new Novice at Flanagan. CMC is going mobile to get in operating time. 4CV0/9 reports into the Virginia 'phone net; his old home state gang. DOR has joined the 1.8-Mc. gang. HFU again is active on 7 Mc. KXX gave up 28 Mc. in favor of 144 Mc. FJT is stationed at Great Lakes and is on 4-Mc. 'phone. QAB and QQC are new calls in Waukegan. The 4th District is well represented around Great Lakes with 4PAS/9 and 4KYD/9 on the air near there. NJE has a new four-element beam on 28 Mc. Novice OUD has his shack completed. CRD is quite active in OO work. It is with regret we report VOA as a Silent Key. Traffic: (Jan.) W9EBX 202, CSW 175, Y1X 106, SXL 101, BUK 79, KJ 64, KQL 62, MUN 48, LXJ 18, LIN 13, STZ 12, MRQ 7, DOR 3, DUA 2, YTV 2. (Dec.) W9FAZ 831.
INDIANA — SCM, Clifford C. McGuyer, W9DGA — FYC is on 75 meter 'phone. CGM is rebuilding. DLU is on 80-meter c.w. MJU is new officer of the TARS paper. CVN has a new antenna. DXL and NH visited JTX/RCB. TT gets out fine with 24 watts on the traffic nets. Novice net frequency is 3717 kc. with W9PAS as Net Manager.

(Continued on page 80)

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Radio Frequency Power Amplifier or Oscillator Class-C Telephony or FM Telephony

D-C Plate Voltage	1000 volts
D-C Plate Current	200 ma.
D-C Screen Voltage	250 volts
D-C Screen Current	30 ma.
D-C Grid Current	10 ma.
Driving Power (approx.)	1 watt*
Power Input	200 watts
Power Output	150 watts*
Heater Voltage	6 volts

* At 165 mc.
(Power output at 500 mc. 120 watts)

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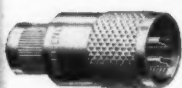
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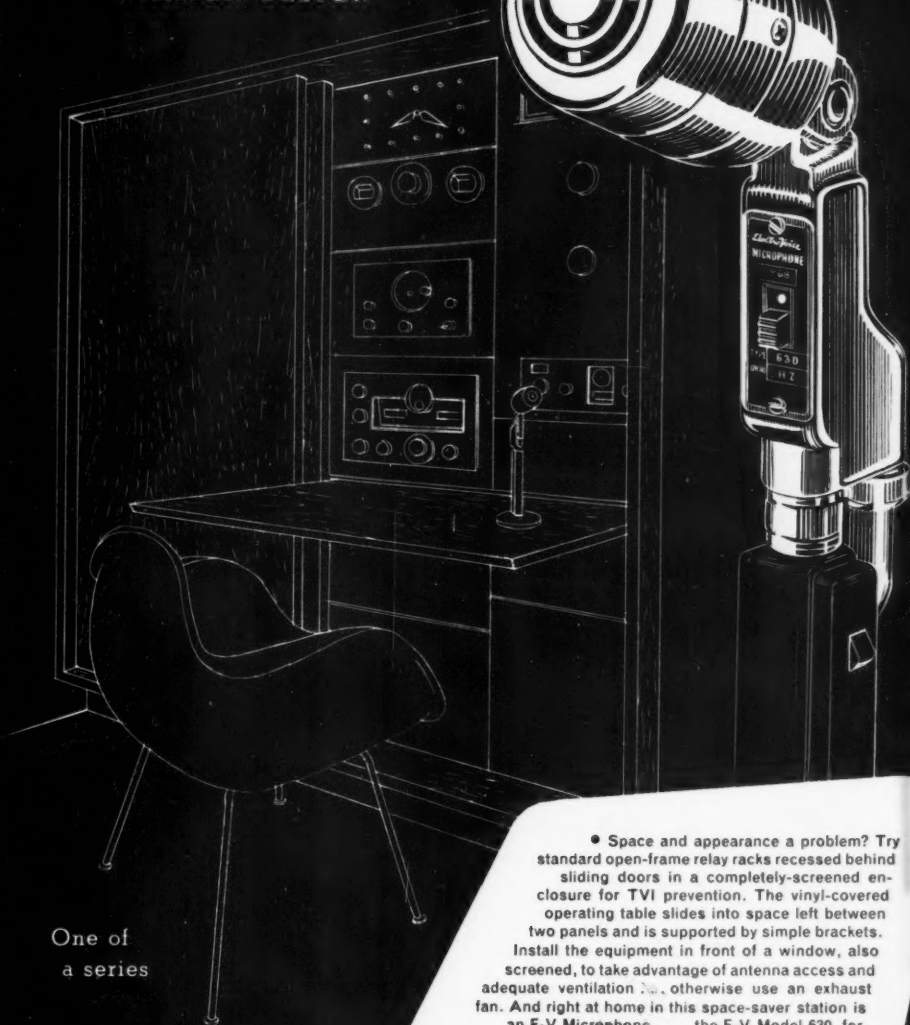
The Anderson Radio Club has a Novice school with 42 enrolled. KAS is new OBS. The Kokomo Club now has 35 members. UNT, new OES, rebuilt his SCR-522. ESQ has 99 countries on 7 Mc. New OPS are YME, IZC, MUR, and MDL. New officers of the Tippecanoe Amateur Radio Assn. are LBE, pres.; JBG, vice-pres.; KOY, secy.; JFF, treas. New Novice calls include PEO, QNZ, PUK, PPC, PLH, QBD, ONZ, QMI, PIU, PSE, PEP, QWU, PAQ, PNG, and PLQ. NZW got his old call. WWT, back. GZB is building new antenna mast. The Michiana Club is outfitting a trailer to be used as a mobile emergency communications center. GRA is editor of the Lake County Club paper. MVZ now runs a kw. INU has a code and theory class. PBS has turned on his receiver again. JRY has 25 watts on 28-Mc. 'phone. New officers of the Indianapolis Club are AT8, pres.; KCP, vice-pres.; D. Miller, secy.; and C. Pence, treas. The Indianapolis Club was organized August 28, 1914, and still is going strong. WRE is on 160-meter 'phone. GGC is recovering from a broken collar bone. FFF and THM have new transmitters. GAR is the State Archery champion. JJP has new mobile transmitter. QQT is new at Elkhart with 6V6 oscillator. IFN had a traffic total of 139 for January, and covered 39 cities. IJH has new BC-610. BKJ made WAS and plans new TVI-proof rig. Total QIN traffic for January was 750. The Martinsville Club has a grid-dip meter and a new TVI committee. FVY is rebuilding his rig. KDY is NCS on IFN while VNF is in Mexico. JVN and FKB are electronic repairmen at Camp Atterbury. FWRC has a code and theory class with NYK as instructor; also a TVI committee under LJJ. BRW is on 75-meter 'phone. The TARS TVI committee is headed by EHU. W. J. Gustin, Osborn, the former treasurer of the Indianapolis Radio Club, passed away Jan. 21st at his home in Indianapolis. Traffic: (Jan.) W9JUL 1403, TT 529, NZZ 336, TG 278, EQG 201, IZC 115, JBG 109, LZI 85, QLW 85, BKJ 74, JTX 68, DGA 65, KDY 48, PMT 30, DOK 24, FZW 22, RZS 17, BDP 15, CVN 5, PCB 2. (Dec.) W9EGQ 1001, VNV 27.

WISCONSIN—SCM, Reno W. Gustin, 'Phone Net (BEN) 3950 kw, 6 p.m. daily. C.W. Net (WIN) 3625 kw, 7 p.m. daily; slow speed at 6:30 p.m. Net certificates (BEN) were issued to GPI, EAN, HEL, DOR, HID, and AOW. ANM is contemplating 144-Mc. operation. NLH is active on 28-Mc. 'phone. LHK is looking forward to new ham shack in his new home. Organisation Feb. 1st, OVO took over the section emergency organization as SEC. All EC reports, comments, and questions relative to Emergency Corps or c.d. activities should be directed to him. IQW is mobile on 3.5-Mc. c.w. and 3.8-Mc. 'phone. FLARC of Madison elected OME, pres.; LNM, vice-pres.; GFH, secy.; LSV, treas.; AYM, W9NPVN, PFK, directors. TRG presented a swell talk on a.s.b. to both the Manacord and DCARC Clubs. FMH is organizing a local 28-Mc. mobile net. The Manacord Novice program was gotten underway by RKT, ZKB, and 4RVF/9. RKT is waiting for Viking transmitter kit. APU is new EC of the Beaver Dam Area. The Della Region and Kenosha Clubs now are ARRL affiliated clubs. ERW is working on 3/4-kw. rig. W9NQCH and W9NPVH qualified for RCC and recently concluded a QSO of 3 hours and 11 minutes. SZL renewed OES appointment. IQM is in the Air Corps. JBF is interested in RTTY. The Blackhawk Club elected FCY, pres.; OOD, secy.; JEY, vice-pres. The Club station, NLV, soon will be on 28 Mc. Milwaukee mobile units provided emergency communication when about 500 telephones were out. FAN completed v.h.f. and h.f. regenerative grid-dippers. LEE worked JBF with new 144—Mc. mobile rig! UFX's car looks like an octopus with all of the antennas—ham, broadcast, and both high- and low-frequency police. Hope to see all of you at the Wausau Hamfest April 26th. Section and organizational meetings of the Council of Radio Clubs are scheduled for the afternoon. Transmitters on 3.8 and 28 Mc. will be on the lookout for mobiles. JXY informs us that the Motor Vehicle Department will now issue call letter license plates to all licensed amateurs who register motor vehicles. Previously, the MVD had interpreted the call letter license plate law to allow such issuance only to cars with mobile installations. Traffic: W9ESJ 503, IXA 101, CBE 92, IQW 92, SFL 75, GPI 70, DR 25, ANM 23, FXA 16, IFS 16, LSK 16, CFT 14, RQM 10, ZGL 8, OOD 4, HDZ 2, OVO 2, W9QFX1.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Everett E. Hill, W0VKP—MYD is State Police Communications Director. He wishes ideas from clubs and individuals on a plan to tie in police and ham mobiles. CFU and MKD are busy installing the new equipment. OEL is NCS of the Goose River Net, which meets each Sunday at 0900 on 160 meters. ZCM is NCS of the Nodak Net, which meets Mon., Wed., and Fri. at 1930 on 160 m. The 75 'Phone Net now stands by for calls on 160 meters. Notify ERW if you wish to check in. New officers of the Jamestown Club are HJK, pres.; EEN, vice-pres.; and KMT, secy.-treas. KMT reports moving to Minneapolis. The Fargo Club is holding a civil defense drill each Thurs. at 1830 on 28,960 kc. Your SCM is interested in qualified individuals applying for EC appointment. (Continued on page 82)

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ment. It is also hoped that more requests for operating appointments will be forthcoming. Traffic: W8LHB 48, KZL 32, NVK 22, ZCM 14, EXO 12, NBS 10, DBH 4, KOY 4, BHF 2.

SOUTH DAKOTA—SCM, J. W. Sikorski, W0RRN—The c.w. net meets on 3615 kc., Mon., Wed., Fri. at 1900 CST; the 'phone net on 3900 kc., Tues. and Thurs. at 1900 CST and Sunday at 0900 CST; the 160 net on 1905 kc., Mon., Wed., Fri. at 1930 CST. New calls are W9GCVY and W9GZE, Vermillion. CAS, Vermillion, has Advanced Class ticket. YMB has a new YL. LMP is heading for the merchant marine. The Prairie Dog ARC, Vermillion, met with the Yankton Club and inspected the WNAX transmitter and new studio. GWH now is permanently located in Neche, N. Dak., as customs official. IWE is on 144 Mc. with converted 522, and is completing Johnson Viking. CRY now is EC for Sioux Falls. GLK is OBS for the 160-meter net. Traffic: W0OLB 92, EHO 51, PHR 37, RRN 23, GWH 7, FJS 6.

MINNESOTA—SCM, Charles M. Bove, W0MXC—Asst. SCM, Jean Walter, 0KYE. SEC: BOL, RM: RPT. KYE now is out of the hospital. Lil Dedon had the spotlight in the Duluth newspaper with a big story and picture. The gang around the Lake of the Woods is planning an emergency net in the area headed by DCM. The Minneapolis Radio Club, Inc., now has 92 members on its roster. ATD had a dandy write-up with pictures for his part in the airport condition reporting on 75 meters. FDS now is an operator at the Hennepin County Sheriff's transmitter. The Arrowhead Radio Amateurs Club in Duluth has elected EVD, pres.; GKP, program manager; and RXL, secy.-treas. VOB and EVD each have a new Viking. JCL has a new 813 final. KYE is working on some 2-meter gear. JNC purchased a new Viking transmitter complete with ECO. He has folded dipoles on 7, 14, and 28 Mc. with a long wire on 3.5 Mc. HKF has an auto-call on 29,640 kc. The Minnesota noon and evening nets have elected new control stations. On the noon net UCV is Net Control, with FIT, NJQ, and LCM as first, second, and third alternates. On the evening net HEO is Net Control, with JIE, GUS, and FYT as first, second, and third alternates. IFS has a new jr. operator at his house. It's a girl. The Twin City gang is investigating the possibility of organizing a Mid-American Convention for the near future. UCV renewed his 2nd-class c.w. ticket. CRO built a compact superhet receiver with battery and vibrapack for emergency use. The Minnesota 'phone nets participated in an airport condition reporting on the nets. Sixty-four airports took advantage of this reporting. This reporting was tried out as an emergency measure. It turned out to be a big success. Now is the time to join the Emergency Corps. Get application blanks from BOL, 1130 Delaware, St. Paul, Minn., or your SCM. Traffic: W0KFF 133, HEO 103, UCV 55, MXC 51, BUO 18, CWB 12, BRA 9, MJJ 9, FTJ 8, TKX 7, KNR 3, RXL 2.

DELTA DIVISION

ARKANSAS—SCM, Dr. John L. Stockton, W5DRW—Everyone reported a big time at the Ft. Smith Hamfest. The next meeting will be held Apr. 19th at Eureka Springs. Contact OUI for hotel reservations and details. GSY is on 14-Mc. 'phone. ICS has a new rig with 829B in final and has named it the 32V-5. GWA is on 3.8 Mc. WNUGY is active from Newport. He is interested in 50-Mc. activity in Arkansas. SZJ works some nets and hopes to be more active soon. UEB is active at Fayetteville. UED is working v.h.f. at Ft. Smith. UBZ is active at Fayetteville. RWJ is mobile on 3.8-Mc. 'phone. W5TID has a new rig and receiver. W5TIC has HQ-129X. The Conway Club is conducting weekly code practice and theory sessions with five new candidates for tickets. STU has made WAS. Please send monthly reports so that they reach the SCM not later than the 3rd of each month. Traffic: (Jan.) W5ICS 151, RWJ 132, LUX 111, EA 40. (Dec.) W5TU 100, W5TID 30, W5TIC 9, W5SZJ 1.

LOUISIANA—SCM, Robert E. Barr, W5GHF—SAY is the new president of the Baton Rouge Amateur Radio Club. The Club has started working on local TVI problems along the lines suggested by the FCC. UOH is a new 7-Mc. man in Baton Rouge. CCD reports a nice traffic total from Lake Charles. JTR runs a kw. to a 304-TL rig. PVR is working mobile with 45 watts. LV was issued the first Amateur Extra Class ticket in New Orleans. LV now has 144 countries worked on 14 Mc. using a 32V-1, with 121 contacts confirmed. PXW works in with So. Texas and New Mexico MARS Nets. MWE, new ORS, probably has the most net affiliations in the State, working with the Pelican, Arkansas SS, RN5, Delta 75, and MARS c.w. and 'phone Nets. MWE is NCS for Arkansas SS, RN5, and MARS c.w. Nets. NG now runs regular bulletins on 7 Mc. throughout each week. GHF has been appointed Assistant Director for the Louisiana section. RDP reports from Lake Charles AFB. He soon will have rigs on all bands, and is at present meeting the Pelican and Delta Nets with 50 watts. K5FCI will be on the air from the Lake Charles AFB. W5TRQ already has confirmed contacts with quite a few different states using only 25 watts on 2730 kc. CEW at last has the big rig back on the air. BMM, CEW, and

(Continued on page 84)

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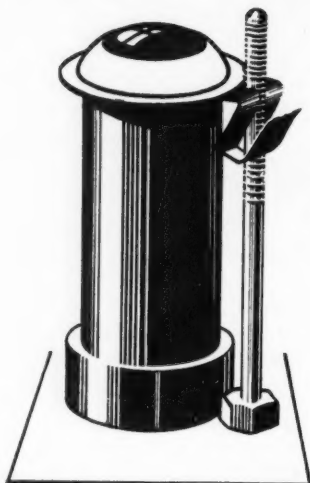
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GHF were appointed as Short Wave Committee for the annual "Dogwood Drive" festival at Plain Dealing, Louisiana amateurs mourn the passing of Grace Daigre, wife of ACY. Traffic: W5NG 228, MWE 66, PXW 8.

MISSISSIPPI — SCM, Norman B. Feehan, W5JHS — LP, our SEC, reports very good progress in lining up ECs throughout the State. New ECs are NYV for south central Harrison County, TUV for Monroe County. New WNs reported are UTD, UTE, UTG, UTS, and USS. We would like cards from all WNs in the State. RUT was heard from in Korea. RMC is on his way to the Far East. SKB now is Advanced Class and a new member of GCH Net. TGF has a new Boomerang and likes it. SSB has new QTH, Pass Christian. DEJ reports CUB lost his 14-Mc. beam to the winds. RIM and RHG are doing an FB job on Jackson traffic. PDJ is Advanced Class and works 3.8 Mc. when not on 7 Mc. The Kessler Club has a new Globe Champion, so no more TVI on 28 Mc. IGW is building a new rig with more power. SMD is in new home. KYC is a very busy man on 3.8 Mc. week ends. NWB is a new GCH Net member. Traffic: K5FBB 297, W5JHS 124, WZ 91, RIM 85, PDJ 15.

TENNESSEE — SCM, D. G. Stewart, WAFL — Section Emergency Coordinator AEE recently was appointed Deputy Communications Director and Radio Officer of Civil Defense for Nashville and Davidson County. FLW reports no activity on 50 and 144 Mc. during January and has a new 820B final on 144 Mc. The new 4-Mc. Phone Net Roster now is available from AEE. Those desiring a copy should send him a self-addressed and stamped envelope. Bill Richardson, LRE, is back with us after about a year's absence. APC is pushing traffic and chasing TVI. PL, vacationed in Louisiana and Old Mexico. FX cleaned up his ART-13 with a few simple measures. LQE has a new Pi-Section final and is building a new 1-Mc. phone rig. HHQ is the proud owner of a new NC-183. ON recently returned from an extended stay in Mississippi. The time in nearing for the Annual Crossville Hamfest. How about it, NJE and KUW? How about you fellows getting the ball rolling? Let's make this one bigger and better than ever. To those who have never attended, I am sure you will enjoy the scenery, ragchewing, and renewing of old acquaintances. Traffic: (Jan.) W4APC 136, IIB 90, RIM 50, AEE 20, PMR 4, NDC 3, (Dec.) W4ODR 100, SZL 13.

GREAT LAKES DIVISION

KENTUCKY — SCM, I. W. Lyle, Jr., W4KKG — KZF has 100 watts on 144 Mc., also a new 20-meter beam. CMP has a nice country total on 20-meter mobile. JUI has frequency-measuring gear for measurements within 5 cycles and is working on still more accurate equipment. PERT entered the CD Party. 9HC now is in Louisville. NEP/TAV handled traffic for Paducah during the recent ice storm in fine style. SZL reports in on KYN some but also spends time on 28 Mc. MGT again turns in a nice traffic total. If you are not now a member of the Emergency Corps write Henry for application blanks. VP now is operating s.s.s.c. and says it's FB! UYI is a new ham in Danville from W2-Land. BAZ conducts civil defense program for Jefferson County and CAP. W4NTRQ is awaiting results of his Class B exam. If you want to know how you sound, just call MDB. He has a new tape recorder. CNE is a regular on KYN each Monday night. JXF and his new Johnson Viking sound FB. As new president of ARTS he is doing a swell job. How about the clubs in the State sending in news of their activities? TFK is new president of the Lexington Blue Grass Radio Club. The Club has reorganized and is preparing a big program for this year. Hope everyone enjoyed the Kentucky QSO Party. The next event coming up will be Field Day. Are you ready? Traffic: W4MGT 290, BAZ 220, NEP 64, PERT 29, CDA 21, KKG 11, VP 11, SZL 3, JUI 2, KZF 1.

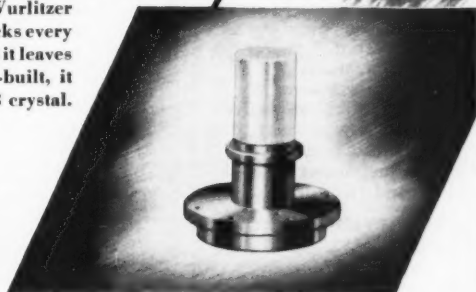
MICHIGAN — SCM, Norman C. MacPhail, W8DLZ — Asst. SCM (phone): R. B. Cooper, SAQA, Asst. SCM (c.w.). J. R. Beljan, SSCW, SEC. G.H.E. RMC: UKV, KYC, ELW, PAM: UTH. New appointments: RXY, EC for Ingham County. Net certificates for QMN were issued to BDF, DAP, DLZ, DOI, DQL, DWB, EGL, ELW, FX, IBB, ILP, IV, QIX, RJC, SCW, SWG, TZD, UKV, WVL, WXO, and ZLK. New Novice tickets in the Midland Area, according to BVY, are W8N8VZ, JAA, and W8JL. DX, LLL, MGQ, and SPF passed Extra Class exams in Detroit. New officers of the Thumb Area Amateur Radio Assn. are VE3DDL, pres.; W8VWY, vice-pres.; W8BEG, secy.-treas.; VE3DIJ, secy. for Canadian affairs. The Second NRA Radio-Rifle Match between Akron, Pittsburgh, Toledo, Detroit, and Grand Rapids was run off Feb. 2nd. CYN, ZDK, IHR, ILP, YKB, and PQB handled the match in Detroit while IV, EXO, FCP, ZCH, DLZ, and W8SHIW did the chores in Grand Rapids. YKC reports some good DX contacts on 3.5 Mc., including AE1 and YV6, with only 30 watts. TIC is remodeling the home rig and building new mobile job. UKV reports a very active 160-meter 'phone net in Detroit. RHD, BTX, and FFD are busy rebuilding rigs in Petoskey. AQA, WRI, KJA, and DLZ are sporting new Lycos. Both the 5- and 10-p.m. sessions of the QMN, 3663 kc., have been discontinued. YKC, Net Manager for the 6- and 7-p.m. QMN nets reports greatly increased activities. New officers of the Detroit Amateur

(Continued on page 86)



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Radio Assn. are MGQ, pres.; HP, vice-pres.; FX, financial secy.; EZJ, recording secy. EGI is debugging a powerful 11' 6L6r. SWF reports increased interest in a code class at Dearborn. YDJ is mobile with a home-brewed "cutie" on 28 Mc. FEI licked TVI by going QRP on the GREX. We'd like some activity reports from the 2- and 160-meter fellows for this column. FX reports his new p.p. 24G final now is complete; it runs 225 watts. URM is about to throw the big switch on a new 400-watter. WJO is plenty busy as technical director of the Flint Club. ZEE is gathering parts for new final—a pair of 807s. GBB now is running a new 814 between 75 and 225 watts on 3.5 and 7 Mc. Traffic: (Jan.) W8RJC 387, ELW 192, SCW 177, YKC 171, CPB 127, QBO 116, ZLK 101, ILP 95, URM 75, JYJ 64, COW 52, DLZ 51, QIX 40, DAP 34, FX 24, IV 23, AQA 21, BVY 21, TQP 17, GJB 14, QPO 14, IBB 10, TZD 10, WJO 10, SWF 8, WVL 8, EGI 6, TIC 3. (Dec.) W8CPB 302, UKV 90, WVL 25, TBP 24, GJB 18, ZEE 8.

OHIO — SCM, John E. Slinger, W8AJW — Asst. SCMs: C. D. Hall, 8FUN, and J. Erickson, 8DAE, SEC: UPB, PAM: PUN, RMS: DAE and PMJ. New ECs are CRL and GUZ. PEN has been made OO, Class I and III. The DARA held a Hamvention Mar. 22nd. The OCARC is planning a Worked All Ohio Counties certificate and an Ohio Intra-state Contest. The Council also is planning to issue awards to the member clubs scoring highest in the SS and DX Contests. The Worked Cleveland Award, sponsored by the CACARC, may be obtained by receiving certificates from any three of the following clubs: West Park, work 10 stations; Westlake, 5; Southeast, 5; and Northeast, 5. YJF now is in the Navy and operating K8NRT in Toledo. JHN is a new Novice in Van Buren. YGH received WNh No. 14 and states FNY has worked more than 50 per cent of the U.S.A. counties. WN8HHF has worked 16 states with a 6L6. LJS, QSL Manager, is on 75 meters with 300 watts. He'll be glad to check through his files while in QSO. ISD will be mobile on 7 Mc. LBH has a new Viking transmitter. PBX soon will be on 144 Mc. FTD is organizing a TC FTRO (Flying Sauer) Net. The Parma Club has 15 mobile units. HOM received his 20-w.p.m. sticker and believes he passed his General Class exam. The Columbus gang cooperated with the "Alert America Convoy" and operated TO at Fort Hayes. DL7AF was a guest of the MVARC at its banquet and managed to visit at several of the members' homes. The LCARA purchased 16 transmitting units from the Elyria Police Dept. LYD, EC for Cuyahoga County, has lined up Net Control Stations for eight separate bands. The Toledo *Shack Gossip* tells us that TCA has a brand-new YL harmonic; EHU and EQT have received Advanced Class tickets; HWX and TWD (Mom and Pop) are acquiring a new son — by marriage. From the Columbus *Carascope* we learn that FWW and HOK are doing a swell job in preparing students at the Columbus School for the Blind for their license exams; GZ and SJB were recent speakers at club meetings; the CARA is preparing a series of 15-minute programs to be aired over one of the local a.m. stations. Springfield's Q5 relates that ex-CSM now is KL7AKW; 80 amateurs live in the Springfield Area; CDT has returned to California; and (GJW and FPA were home on leave from the Navy. Traffic: (Jan.) W8FYO 366, DAE 279, ARO 251, IB 242, RIR 144, SG 136, UPB 84, YCP 65, WE 34, DXO 32, AL 31, ZAU 31, GZ 28, PUN 20, IZQ 19, AJW 17, DMJ 13, EQN 10, LG 10, YGR 10, AQ 4, FJX 2, WN8HHF 2, W8AHM 1, BUM 1, ET 1, FTD 1, PMJ 1. (Dec.) W8YCP 183, SFI 40, GAV 26, BUM 2.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, LW2LLI — RMs: TYC, KBT, PAMs: IJG, NIV, JQL. On Feb. 9th NY8 celebrated its fifth anniversary. NYS Net meets on 3615 kc. at 7 p.m.; NYSS on 3625 kc. at 8 p.m. daily. Our full support should be given to these nets. New outlets are needed. A new call in Cairo is JYO. WGE is on 3.5 Mc. with low power while rebuilding. FEN, now stationed at Philadelphia, sends his regards to the gang. The Rip Van Winkle Club reports new Novice members as follows: WNs FED, KHQ, and EWO. EFU plans to get back on 144 Mc. when he gets up an antenna. AREC activity is at an all-time high. VP, Ulster County EC, is getting FB cooperation from c.d. in Kingston and reports LEL, FBV, DVZ, and VP now are mobile on 3.8 and 28 Mc. SNN and LDS report AREC is very active. YXE has completed new rig which covers 3.8 through 144 Mc. AWF completed improvements on 144-Mc. Yagi. WHX has new 183 receiver. HUB is mobile on 3.8 and 14 Mc. Appointees are reminded to check their endorsement date. We are still waiting to hear ZOY. Is your club represented in this news? If not, let's hear from you. How about a section get-together next LO-Nite? Let's have suggestions on the low end of 75 meters. GM was the guest speaker at the Rip Van Winkle Club; your SCM also was present. APF would like to hear from old-timers (10 years or better) in the Tri-City Area. He has plans for a shindig. CLL is enjoying a good rest and will be back with us in the fall. Appointees: VP and DVZ as ECs; WIK and JQL as ORS; JQL as PAM. Endorsements: AAD, VRE, SQW, WBH, PCQ.

(Continued on page 88)

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Heathkit 5" OSCILLOSCOPE KIT

- New "spot shape" control for spot adjustment — to give really sharp focusing.
- A total of ten tubes including CR tube and five miniatures.
- Cascaded vertical amplifiers followed by phase splitter and balanced push-pull deflection amplifiers.
- Greatly reduced retrace time.
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- New mounting of phase splitter and deflection amplifier tubes near CR tube base.
- Greatly simplified wiring layout.
- Increased frequency response — useful to 5 MC.
- Tremendous sensitivity .03 RMS per inch Vertical .6V RMS per inch Hor.
- Dual control in vernier sweep frequency circuit — smoother acting.
- Positive or negative peak internal synchronization.
- Multivibrator type Wide Range Sweep Generator.

A brand new 1952 Heathkit Oscilloscope Kit with a multitude of outstanding features and really excellent performance. A scope you'll truly like and certainly want to own.

The kit is complete with all parts including all tubes, power transformer, punched and formed chassis, etc. Detailed instruction manual makes assembly simple and clear — contains step-by-step instructions, pictorials, diagrams, schematic, circuit description and uses of scope. A truly outstanding value.

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Heathkit VACUUM TUBE VOLTMETER KIT

- New styling — formed case for beauty.
- New truly compact size — Cabinet 4 1/8" deep x 4-1/16" wide x 7 3/8" high.
- Quality Simpson 200 microamp meter.
- New ohms battery holding clamp and spring clip — assurance of good electrical contact.
- Highest quality precision resistors in multiplier circuit.
- Calibrates on both AC and DC for maximum accuracy.
- Terrific coverage — Reads from 1/2V to 1000V AC, 1/2V to 1000V DC, and 1 to over 1 billion ohms resistance.
- Large, clearly marked meter scales indicate ohms, AC Volts, DC Volts, and DB — has zero set mark for FM alignment.
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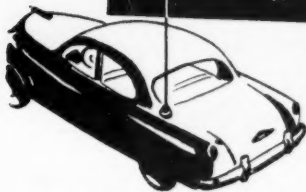
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and YXE as EC's. Traffic: (Jan.) W2TYC 145, EPU 84. (Dec.) W2BNC 544, TYC 272, EPU 130.

NEW YORK CITY AND LONG ISLAND — SCM, George V. Cooke, jr., W20BU — Asst. SCM, Harry Dannels, 2TUK. SEC: SYW, RM: TUK, PAM: YBT. Another first in the section is the formation of a YLRL Club with JZX, pres.; WN2KDP, vice-pres.; WN2KEB, secy.; WN2BXT and WN2IZL, board members. HAE is out of the Navy and back on 144 Mc. The Jamaica U.H.F. Club now meets in the Jamaica YMCA and has resolved to get the entire club on 420 Mc. Gear has been presented and DKH, QPQ, and DVK have received Official Experimental Station appointments. In other parts of the section KFY, OHE, and ELT have received their OES certificates. KRM and PTO have converted ARR-ls for 220 Mc. and PTO has a sixteen-element horizontal 420-Mc. beam working. PTO, KRM, and PAA are setting up skeds with CEP and GNB on 420 Mc. WN2LWJ, just out of the Coast Guard in Alaska, now is working NMY at East Moriches and has gone 144-Mc. mobile. WN2IDK is very active and made a good score in the recent Novice Roundup. EBY has been appointed OBS and also holds OO appointment. NPU has been appointed EC for Northeastern Nassau. NPU has received a Section Net certificate for his participation in the Queens 10-meter AREC Net. PC is very active on 2- and 10-meter mobile and is eligible for a Pioneer ticket. UYX and AAB are in the AF. WN2IQS, KFY, and K2AC now sport MARS calls. AHV has received his Class A ticket. YBT finally completed coverage and got his WAS certificate. CLG, by participating in the NY City Phone Net, earned his OPS appointment. JZX is running a code class on 3805 kc. 11 to 11:30 a.m. Mon., Tues., and Thurs. IVX has been extremely busy in the Brookhaven Area getting the boys on 50 Mc. ENW has been appointed OO and ran up a score of 4400 points in the recent CD Party using only 10 watts on 3.5 Mc. Can't we get more of our appointees in this section to join in the CD Parties and given up the competition? What say, fellows? Let's make it hot the next time. QBS is back on 144 Mc. after a very long lay-off. WN2KCW and WN2GNB are new in the Nassau AREC. MZB is expected back from Korea any day now. SJC, lt. (jg), was aboard the destroyer which picked up Capt. Carlsen and writes of communicating with him during the long vigil and aboard after the rescue from the *Flying Enterprise*. GP increased power to 40 watts and NC'Ses TLAP frequently. PF is active testing 144.05 Mc. for MARS Mobile Net. DZK now is operating from new shack in the yard, loading a 16-foot whip and received his OBS appointment for attendance in the NLI Traffic Net, which meets at 1930 nightly on 3630 kc. and seeks more outlets around the section. Contact the RM, TUK, or the SCM for details. This applies to any net in the section. VNJ complains that heavy flying skeds with PAA interfere with making BPL. DXN is maintaining tough program at Manhattan College, School of Engineering. BIV has been appointed OBS in Brooklyn to keep the AREC. There informed at all net times. DZK worked K6AG in California with 10 watts to his 807. Traffic: (Jan.) W20BU 356, VNJ 191, GP 172, JBQ 152, EC 143, LPJ 96, OJX 46, MQB 41, LRI 40, OUT 34, PZE 31, TUK 28, IN 25, DIC 24, DXN 17, DZK 17, KFY 16, LGK 16, PF 15, HQM 10, KYN 7, RQJ 4, YBT 4, QOW 3. CLG 2. (Dec.) W2DXN 5.

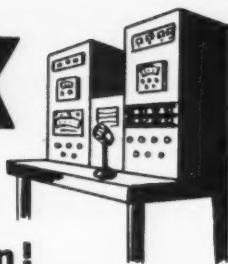
NORTHERN NEW JERSEY — Thomas J. Ryan, jr., W2NKD — SEC. VQR, Asst. SEC: IYN, RM: CGG, PAM: CCS. The Jersey Net meets nightly except Sunday at 7 p.m. on 3700 kc. The Jersey Phone Net meets Sundays at 9 a.m. on 3900 kc. Now that FCDA has made definite plans for RACES, we can go ahead with planning in New Jersey in the proper direction. Very soon a series of c.d. meetings will be held throughout the State, designed to explain the organization and to answer questions. The meetings will be held by c.d. districts, the first of which will be in the metropolitan district, followed by the northern, central, and southern districts. Meeting dates will be announced later. By the way, listen to the New Jersey C.D. Net Sundays at 9:30 a.m. on 3995 kc. You can keep posted on all c.d. news by listening to this net. If your c.d. area is not represented, contact VQR and make arrangements to report into the net. You'll find it worthwhile and extremely interesting. LIQ has been placed in charge of radio in Elizabeth, both c.d. and as the League EC. NGX is the new EC of Jersey City. JYW reports great progress in Belleville. The Belleville C.D. Net meets every Sunday at 10 a.m. on 29.6 Mc. The Belleville Amateur Radio Club was forced to tie in all operations, with meetings held monthly at the recreation house. Officers are JUU, pres.; BRP, vice-pres. and treas.; JYW, secy.; and directors VD and Frank Rovell, chairman of c.d. communications. Others are QME, SGR, HNA, HZI, CCK, 8MX, IGW, and HOR. GVZ built a new room on his home as his shack. CJX is having a rough time; first he broke an ankle and then a wrist. CUJ had a traffic total of 418 this month. EAS got a new certificate from the Second Regional Net. LOP reports Roelle Park c.d. station licensed as LUF. NCY has new TBS-50 and HQ-129 for DAS, the Dumont c.d. station. ZK is back from a 4-month trip to Nebraska and again is a steady on JN, running 200 watts and a VFO. WN2N is newly licensed in Calif. He also is 3STZ at Carnegie Tech. The Elizabeth c.d. group again answered the call when the

(Continued on page 80)



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THREE-GANG TINY MITE CONDENSERS

Hams, Radio Constructors and Experimenters can find many uses for these compact, three-gang condensers. Designed particularly for high frequency use, they are adaptable for use in converters, preselectors and receivers covering the Amateur, Television and F.M. bands. Well

constructed with soldered brass plates and ceramic brackets. Rotor shaft extended $\frac{1}{4}$ " at rear. Height $1\frac{1}{2}$ ". Width $1\frac{1}{4}$ ". Length behind panel $3\frac{1}{2}$ ". Mounting holes $2\frac{1}{2}$ " apart.

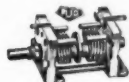


Catalog Number	Cap. Per Section		No. of Plates Per Section	Amateur Net
	Max.	Min.		
LC-1845	11	5	3	\$3.81
LC-1846	17	5	4	4.32
LC-1847	25	6	5	4.71

TINY MITE DUAL CONDENSERS

The construction of these units is similar to the regular Tiny Mite Tuning Condensers. The two end pieces are held together firmly with two tie-rods.

A separate round plate is soldered on rotor rod to shield the two stator sections. Large surface front and rear sleeve bearings, provide smooth rotation.



Catalog Number	CAP. PER SECTION		Air Gap	No. Plates Per Section	Over-all Length	Amateur Net
	Max. MMFD.	Min. MMFD.				
LC-1659	8	2.5	.017"	3	$1\frac{1}{4}$ "	\$2.64
LC-1660	15	3	.017"	5	$2\frac{1}{4}$ "	2.94
LC-1661	25	4	.017"	9	$2\frac{1}{2}$ "	3.24
LC-1662	50	6	.017"	19	$2\frac{1}{2}$ "	3.30
LC-1663	100	9	.017"	37	$4\frac{1}{4}$ "	3.66
LC-1664	10	4	.037"	7	$2\frac{1}{2}$ "	2.94
LC-1665	15	5	.037"	11	$2\frac{1}{2}$ "	3.24
LC-1666	25	5.5	.037"	17	$3\frac{1}{4}$ "	3.57
LC-1667	35	6	.037"	21	$4\frac{1}{4}$ "	3.93

TINY MITE TUNING CONDENSER SINGLE SECTION



This series of condensers has been designed for applications where space or weight are limiting factors and for tuning of ultra-high frequency circuits. Rigid construction, close fitting bearing, positive rotor contact and Steatite insulation are the outstanding features. Cadmium plated, soldered, brass plates and rods insure high frequency efficiency.

Catalog Number	Cap.		Air Gap	No. of Plates	Amateur Net
	Max. MMFD.	Min. MMFD.			
LC-1640	8	2.5	.017"	3	\$1.35
LC-1641	15	3	.017"	5	1.47
LC-1642	25	4	.017"	9	1.53
LC-1643	35	5	.017"	13	1.77
LC-1644	50	6	.017"	19	1.86
LC-1645	75	7	.017"	29	2.01
LC-1646	100	9	.017"	37	2.19
LC-1648	10	4	.037"	7	1.50
LC-1649	15	5	.037"	11	1.62
LC-1650	25	5.5	.037"	17	1.92
LC-1651	35	6	.037"	21	2.10
LC-1652*	50	8	.037"	35	2.64
LC-1653	6	3.5	.073"	5	1.59
LC-1654	15	5.5	.073"	15	1.92
LC-1655*	25	9	.073"	27	2.61

*Denotes double bearing.



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second plane crash occurred in Elizabeth. GOG came to the Haritan Valley Club to address the membership and went home with a puppy! NTW is the latest member of MARS. LTI averages 10 hours a day on 'phone and c.w. IIS and ZOC are doing great c.d. work in the Caldwell. MKT and NVA are handling c.d. radio in Clifton. Their group includes ZKG, OZU, FCL, IZF, ZCC, NEZ, JAF, WZX, SUX, CRJ, and NHE. The two last-named are WN2s. The c.d. station is in the City Hall basement. If you work 'phone, please contact CCS and ask him to send you application blanks for Official Phone Station appointment. You have much to gain with this League appointment. If you work c.d., contact CGG to become an Official Relay Station. Traffic: W2CUI 418, CCS 211, WCL 113, EAS 101, LMB 101, ANG 61, CGG 41, ZK 38, DRV 14, NCY 9, OUS 8, ZEP 8, NIY 4, LOP 3, CFB 2, CJX 2.

MIDWEST DIVISION

IOWA—SCM, William G. Davis, W0PP—Thanks, fellows, for the nice bunch of reports. DIB had a nice contact with W0NPB/AM, who was flying in TWA Constellation over Pittsburg. FQJ now is in Tucumcari, N. M. The Cedar Valley Radio Club elected three new directors, UCY, UWF, and JTE. Next will come the election of club officers from among these three directors and YDX, GIM, ARW, REX, KTQ, and NSN. The two youngest members are EOY and GNN. FKB reports that his XYI, now is WN0GYE. SCA has resigned as Manager of TEN, being replaced by ITQ. Doc says TEN is going FB. AEH reports from Mesa, Ariz., and sends 73 to the gang. QVA reports BDR and PZO have new Viking transmitters complete with VFOs. New to TLCN is CQL, whose XYI is DUU. XFO is back in the fold with a new bandswitching 60-watt job. DET now is with TLCN. GZ had a rough time of it in the hospital but is nicely on the mend now. TQG is back on the air with a new rig. YTA says he's ready to go to 144 Mc. VRA plans to visit the Marshalltown Club. ATA reports he's building his rig over to fit the desk on which he studies. SEF is reporting in to Milwaukee Railroad Emergency Net. FP has resigned as SEC. PP is busy getting the AREC appointments renewed. PP has a complete roster of the Iowa 160-meter Net. The members soon will be sporting new net certificates. They are going great guns, too. Thanks for the cooperation, fellows. Traffic: (Jan.) W0SCA, A7W, GVA 116, YPA 85, PZO 40, DFD 33, VRA 17, ATA 14, SEF 8, (Dec.) W0BDR 163.

KANSAS—SCM, Earl N. Johnston, W0ICV—SEC: PAH, RM: FDJ, PAM: HEC. The Johnson County Radio Amateurs Club elected IIF, pres.; NZP, vice-pres.; LQV, secy.; and DYW, treas. The Kaw Valley Radio Club of Topeka elected OBO, pres.; CFY, vice-pres. and treas.; and NCY, secy. The High Plains Net elected MUN, of Wichita, as Net Manager; ZJE, of Falls City, Nebr., secy.; and FDJ, liaison to other nets. Meeting nights are Mon., Wed., and Fri. at 1930. The Missouri Valley Net of Leavenworth operates on 28.850 kc. Mon. at 2015 and still is clicking with 100 per cent reports and making 44 traffic points for the month. Twenty members comprise the net, with fourteen mobiles and one tractor mobile. KOP, who has Harvey Wells mounted and operating on all bands. Preparations for Field Day are under way. The Radio Club of the Field Kindley High School of Coffeyville elected W0FXL, pres.; FRB, vice-pres.; and WN0FTY, secy. New calls are FRB, FRD, FTR, FTE, FTC, FTH, FTL, FTY, FUE, FUF, FVU, FVJ, FWS, FWT, FXL, FTZ, and FVZ. The Club station runs 12 hours a day, 75 watts to a pair of 24Gs 3732-ke. crystal, and recently installed new HRO receiver. The Radio Amateurs Club of Atchison elected IWS, pres.; BEV, vice-pres.; and TUH, secy. Recent additions to the Club are EUF, GBM, GCW, and John Wirthman, all Maur Hill students. Extensive plans for emergency operations have been made, including several emergency power plants being made available. We regret to add to Silent Keys AJY, a retired telegrapher who had his ticket only about a year. He worked both 'phone and c.w. and was the oldest member of the Kaw Valley Radio Club. Traffic: W0NIY 72, BET 51, BLI 38, FDJ 36, KXL 13, YFE 8, LIX 6, BNU 5, ICV 5.

MISSOURI—SCM, Clarence L. Arundale, W0GJB—It is with sadness that we report the recent passing of Frances Brown, W0ISU. The Hannibal Amateur Radio Club has moved to the Naval Reserve Training Center and soon will have the club station, KEM, on the air. PTG worked with the Illinois Emergency Net on mine explosion at West Frankfort. In early January about 20 towns in Southeast Missouri were without power and communications because of a bad ice storm. PTG put his emergency equipment into operation and secured emergency power generator from Bluff Amateur Radio Society. Considerable emergency traffic was handled during the eleven-day emergency. Some of those who assisted were PTG, QMF, IQY, CFI, EXN, MJT, MTB, ABY, RMX, LBM, and EKW. FIR has received a Public Service certificate for his work in connection with the East Alton Flood. The Rolla Radio Club is preparing to present another amateur radio program over station KTRR. DYR has 32 watts and twelve-element beam on 220 Mc. VFN is on overseas duty. BKV is in the Army. The XYI of DNF now is WN0GYE. HRC's son

(Continued on page 92)

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132C
132XC



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140



142



100
100X

JUNIOR MODELS

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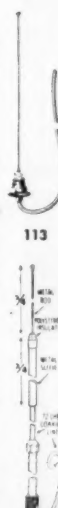
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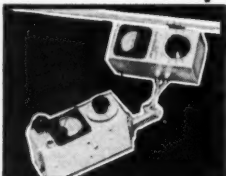
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holds WNFEX. RR is back on the air after several years' inactivity. LI is preparing to move into his new home and erect new all-band antenna. FSZ is trying to work WAS on 75-meter 'phone with 6 watts. JVF is going mobile with clamp-modulated 807. BUL now is in Webb City. HARC held its regular meeting Jan. 18th and presented two technical pictures obtained from General Electric. Now that the new call-letter car license plates are being issued, HUI urges that all Missouri hams apply for their new plates promptly. Between traffic schedules on 80 meters, BVL has worked some nice 80-meter DX. QXO continues as winner of another BPL certificate. Traffic: WQXO 716, BVL 146, IQY 127, GAR 113, GBJ 77, CFL 72, EBE 38, FIR 36, PTG 34, CKQ 29, HUI 23, OUD 21, PTG 10, QMF 8.

NEBRASKA — SCM, Guy R. Bailey, W0KJP — Omaha Emergency Corps, with 14 mobiles, assisted the Omaha Mothers March of Dimes collection Jan. 31st, helping to collect \$42,000. Control Station EQU, in City Hall, was manned by BKE, CSN, QHG, and UFD. New officers of AROC are PHW, pres.; CQX, vice-pres.; QHG, secy.; YMU, treas. CKZ reports new officers of North Platte ARC are CBH, pres.; EXP, vice-pres.; CKZ, secy.; with ATU his assistant. EDL is the new call of Jack Mattern, back on with an 813 after many years' lay-off. PJZ and BDT are mobile now. Novice FRV is helping ZNI to keep Greenwood on the Nebraska nets. YNA, new reporter on the c.w. net from Norfolk, has Harvey-Wells Bandmaster De Luxe. FMW again is active on the 160-meter net. BZC still is keeping his daily sked with BOQ. KDW is keeping weekly with LAJ. NXP reports both he and YDC have finally whipped TVI. ATU is teaching code to an embryo ham, also keeping Grand Island on the c.w. net. DHO finally has whipped TVI. VOI and QXR are both on s.s.b. GKL is running 750 watts on 14 Mc. with three-element wide-spaced beam. ASI, HXH, IGL, and OKI are new reporters on the 75-meter net. All Nebraska nets are functioning. I thank the new NCs KON, JJD, FMW, and UVU. Also thanks to the gang for the nice reports this month. Traffic: (Jan.) W0KON 300, EQB 88, LAJ 68, KDW 47, FMW 29, SAI 19, IXL 16, YNA 16, WBF 9, AUH 7, HQQ 6, BZC 5, (Dec.) W0FMW 28.

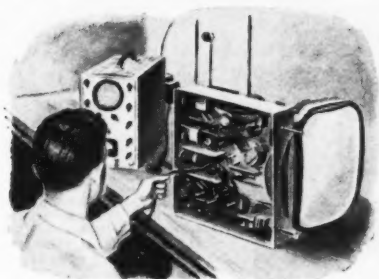
NEW ENGLAND DIVISION

CONNECTICUT — Acting SCM, Roger C. Amundsen, CWHYF — SEC: LKF, PAM, STU, RM, HYF, KYQ still is top CN man with 42 QNL followed by HYF with 30, AYC 26, RRE 25, GVK 21, ONU worked FASBG on 3.5 Mc. with 35 watts. CCH is busy on 10-meter mobile. OQ 2VMX/1 says signals are mostly FB. DJV once more pleads for a successor as editor of the bulletin. The job goes to the first one we can find with printer's ink in his blood. RWD, active in c.d. work, says he is the only ham in Woodbridge. ODW is building 7-Mc. ground plane. The Manchester Club has transmitter hunts with mobiles. EMF and LLM, both ECs, send long reports on their gangs. UVF and UFW are a father-and-son team with TBS-50 on 3.5 Mc. LWW is on 75 and 10 meters with TBS-50. EMF has new 805 modulators. Milford ARC is on 144 Mc. JBK is mobile on 3.8 Mc. PXX is mobile on 3.8, 14, and 28 Mc. LEI has 2E26 on 144 Mc. RMZ has 'phone patch. OPY is on at his new QTH, WN1UWU, on 3712 kc., is new Novice in Milford. KUN is moving to new QTH. WN1UYN will be /5 for a spell at Ft. Sill. HAX has new 2- and 10-meter antennas. LV now is a grandpa. APA gets on 6-7 a.m. on 7 Mc. NE is back on 7052 kc. The CARA had a transformer talk by PDP, SLN and BGT visited TIB. GVK won third prize and HYF fourth prize in the CN Party held last fall. GVK got 3-inch 'scope tube and tuning condenser and HYF got a pair of 8019 tubes. VB is looking for someone to climb a tree to put his wire up again. CTI now is on 'phone, 2-meter mobile. LZE still is on 14 Mc. NOM is building 10-meter mobile. STU visited the New London gang. My RFD mail-box is hard to fill so keep the mail coming, gang, with news for this column. If your appointment has not been renewed by the time you read this you probably won't have it long. Last warning. Traffic: (Jan.) W1AYC 328, HYF 154, AW 152, SJO 148, RYQ 93, LV 93, BDI 79, EMF 55, NJM 45, STU 30, RWS 28, GVK 24, WBT 23, ODW 18, RRE 17, CUH 13, NBP 9, KV 6, (Dec.) RVST 47, CUH 16, APA 8.

MAINE — SCM, Orestes R. Brackett, W1PTL — SEC: ICW, RM, LKF. New frequencies and time: Tree Net, 3596 kc. at 1900, Mon. through Fri.; Sea Gull Net, 3960 kc. at 1730, Mon. through Fri. AI is the first old-timer in the State to our knowledge who has applied for and received the new type of license (Extra Class). Olin has been in ham radio since about 1913. TAM, of Berwick, is doing a nice job on 75-meter 'phone. SGO, of Gouldsboro, also on 75 meters, has a very nice signal. New Novices that we know of to date are VBU, Erwin Parker, Madison; ULQ, Hollis Brown, Auburn; UTR, Verrill Taylor, Auburn; UTQ, Hal Taylor, Auburn. Mable, the XYI of TBZ, finally got her ticket with the call UQT. Phyllis, the XYI of JSY, also got hers with the call UWT. The first get-together that we know of for the year is to be the Rendezvous of '52, which will be held in Auburn at the Odd Fellows

(Continued on page 94)

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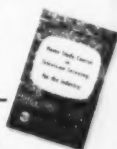
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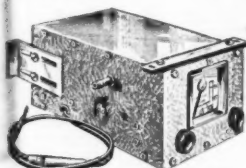
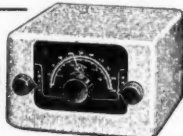


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Hall on the 31st of May. There is going to be a pie-baking contest for the XYLs. Don't ask me how it is going to be judged but it will be fun and provide the dessert for the swell supper that will be served. There also will be a glass-blowing demonstration and one on electronics put on by Bates College and, last but not least, a dance. Oh, yes, a mobile hunt, too, with prizes. Traffic: WJOHT 50, PTL 43, LKP 41, EFR 39, BTY 28, HXQ 27, MFJ 23, OLQ 20, NXX 18, QEK 14, SEJ 12, AFT 8, JIS 2.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, Jr., W1ALP — BHW now is EC for Chelsea; UG is EC for Falmouth; WB is EC as a member of Region 5 committee for c.d. work. Appointments endorsed: AS EC — RCJ, Marlboro; JNV, Milton; KTG, Cambridge; UE, Wellfleet; AAQ, Concord; JJJ, for National Guard Emergency Comm. Plan. As ORS — JJJ, TY, PU, As OPS — HIL. Activity on 144 Mc.: SXD, TQG, Belmont; IAP, PBJ, CX, IPU/1, Boston; WNIUVF, TWK, Quincy; RWT, Hamilton; OLP, QON, Walpole; UAW, UXO, Quincy. WB reports the forming of the Belmont Amateur Radio Club for c.d. work. CLS is on 420 Mc. RTU and RER have gone to sea again. HX called a meeting of the DXCC gang. THU transferred to W2-Land. BB is busy with tests on 1.9 Mc. for DX. WNIUIC, Joe Mahoney, is a new ham in Milton. Louis Prince is W1VOH and KZ5LP. The Parkway Radio Club had a supper get-together with HIL, LYL, HYG, KVH, and TQZ present and an 11 o'clock toast to UDC, who left for the South. Club officers are HIL, pres.; KVH, treas.-secy.; LYL, vice-pres. The South Shore Club had an FCC night with GM, QVC, and QMD as guests; also slides by FWS of various members' stations. The Brockton Club held election of officers and a lecture. The Quannapowitt Radio Assn. had OEX as a speaker and held an election of officers. The Eastern Mass. Club had PMZ as a speaker and CTW and CLS on 50-Mc. work and rigs. They conduct code practice at 7 p.m. DWO now is in MARS. The Braintree Radio Club held its monthly meeting. GDY has Extra Class license. UKU, ex-3PLK, and UPO, ex-3QZB, are in Cambridge. UPO has his Advanced Class ticket. WNEIJ/1 is in Boston. The T-9 Radio Club held a meeting at the new KON/MJE. QTH in Beverly. HZR has TBS-50D and is on several bands with a VFO being built. Helen Wright, WNIUPZ, is on 3.5 Mc. and is working with PST in c.d. work. WNIUTX, RPM's XYL, is on 3.5 Mc. RSE is busy TVI-proofing his 150B, and is in N.E. Emergency Net on 3.9 Mc. BWN, Lynn, has a TBS-50D and gets on 7 Mc. MAN reports that a meeting was held in Lowell for c.d. work for Region 4. SCS has applied for OPS appointment. She is Alt. N.C. for the Deep Sea Dragnet, is a member of the Sea Gull Net, and has MARS certificate. New Novices in Wellesley: UVN, TTY's XYL, UWF, UXB, UNC, and UYH. The Wellesley Radio Club held a meeting with a talk on tubes by a Raytheon engineer. AWA sends in news about 50 Mc. New stations on air are MLS, GUL, 30TC/L, LEI, and WB. GAA is building rig. ELF has new beam, a 3-eyer-3. WNIUTT is Bob Morse. The Gypsy Radio Club has a net on 28 Mc. Tues. and Thurs. at 6:30 p.m. The Club had as guests 20 members of the Merrimack Valley Radio Club. STA, our EC for Haverhill, has as his assistants IWR, MTS, and SNZ. STA is on 7 and 28 Mc. FEC has a net going in Middleboro with JNF, KLS, LDZ, and LEI. I have sent FEC to be our EC. JJJ gets on MARS, the Dog Net, and MX. K1WAF moved to the side of the Commonwealth Armory. RCJ, our Marlboro EC, has had a busy year with c.d. work and as president of the Framingham Club. Officers of the Yankee Radio Club are OLC, pres.; LMP, vice-pres.; KYO, secy.-treas. PIM gave a talk on crystal converter for 144 Mc. KVO gave a talk on color TV systems. Pat Smith is UOC, Winthrop. BB, our EC, is getting things set up for c.d. work. TQF is forming a mobile net in Boston on 144 Mc. Traffic: (Jan.) WIEMG 548, LM 160, TY 138, JCK 121, NUP 74, SS 68, WU 47, DMS 41, BY 26, CTR 17, AVY 11, NWL 10, THU 6, BB 4, QON 4. (Dec.) WIMX 208, ILN 2.

WESTERN MASSACHUSETTS — SCM, Victor W. Poutinoff, W1E0B — SEC: JYH, PAM: RDR. RM: BVR. West Mass. Net meets on 3725 kc. at 7 p.m. Mon. through Fri., combined regular and slow speed. Sixteen different stations reported into the net during January. Let's have some more. WNIUVI already has eliminated the "N." Who will be the first to come up with an Extra Class license? MUN met several of the W4 gang in Florida and handled mobile traffic at 60 m.p.h.! RHU was one of 40 finalists in the science talent search with his home-grown Geiger Counter. AMI is a civilian again and is active on the air. BDV is finishing up a gadget that he expects to submit to an educational publication shortly. TZA has 10-meter phono rig perking. TRB expects to join WIMN shortly. New ECs are NZD, Auburn; NAX, Milford; CLO, North Brookfield; BNO, Fitchburg; HPB, Westboro; and SPF, Worcester. If you haven't registered with your EC yet, I urge you to do so. It may be a requirement for RACES operation. See QST for details on RACES. I am looking forward to meeting each and every one of you at the coming New England Division Convention in West Springfield to be held June 14th. Traffic: (Jan.) W1BVR 102, RHU 100 TAY 19, TZA 13, MOK 12, GVJ 10, BDV 4, NY 4, CJK 2, RRX 2, QJN 1.

(Continued on page 98)

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OTHER FEATURES INCLUDE: separate AM and FM sections; tuned RF stage on both AM AND FM; temp. compensated oscillator; high-Q RF coils; AVC; miniature iron-core I.F. transformers; terminal strip for external AM and FM antennas if required; advanced AM superhet and FM ratio detector circuits; **FOUR**-position switch for: AM/FM/Phono/TV-Audio or recorder!

SPECIFICATIONS: 10 tubes — FM: 3-6BA6, 6BE6, 6AL5; AM: 2-6BA6, 6BE6, 6AT6, and 6X5 rect. Three controls: tuning; on/off/vol.; switch AM/FM/Phono/TV-Audio. Separate inputs for phono and TV-Audio; output for audio connection to any amplifier or TV set. Ultra compact size: 11 1/4" wide, 5 3/8" high, 9 1/2" deep (10 1/2" deep incl. knobs). Ship wt. 15 lbs.

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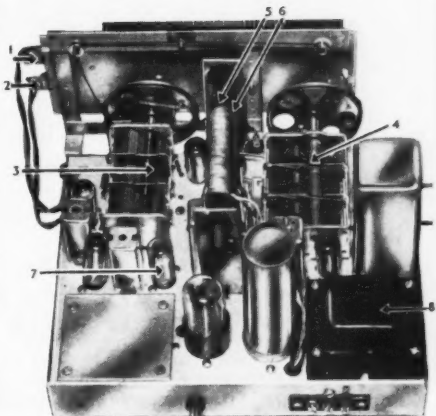
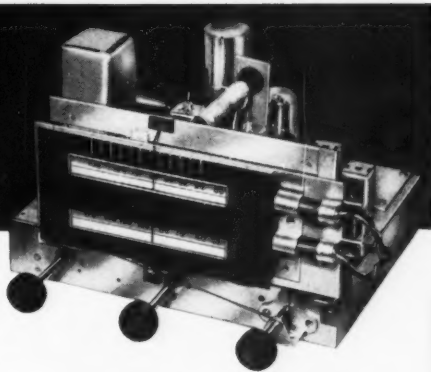
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#3 — SAVE \$47.00. Plus a **FREE 2-year** subscription to "High Fidelity" Magazine (\$8-worth of copies)! FM-AM tuner, Bogen PH10 amplifier, V-M 950 3-speed changer with crystal turnover cartridge.

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#4 — SAVE \$53.00. Complete **CLOCK-RADIO** system! Includes FM-AM tuner, Economy-King 5-watt AC amplifier with mike and phono inputs, and 12" coaxial PM speaker having a 2-pound Alnico-S magnet, and **ELECTRIC SWITCH-TIMER**.

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12" COAXIAL PM SPEAKER

— with built-in crossover network, 2-pound Alnico-S magnet, 12" cone woofer, 3" cone tweeter. 8 ohms. List price \$30.50!

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DUAL CARTRIDGE — reluctance type, same as reg. stock except for packaging. Separate sapphire baton styli for 78 and LP. Reg. \$8.20!

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February 1, 1952

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Dear Pete:

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Please be sure to save us ten copies from the first press
run.

You already know that hundreds of inquiries from engineers
and amateurs come in all through the year from our Handbook
advertising. But perhaps you did not realize that Handbooks
are referred to every day by our top executives, our engi-
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In past years we've never had enough of them, so this time
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OF

The RADIO AMATEUR'S HANDBOOK

IS NOW READY!

An invaluable reference work and text for everyone — hams, engineers, lab men, technicians, experimenters, students, purchasing agents.

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After months of careful effort we have at last assembled the material — and the result is the 1952 Edition. In its pages will be found, in addition to accumulated knowledge since the first Handbook was issued in 1926, the latest proved findings and experiments invaluable to ham and engineer alike. Every field of ham radio is covered: transmitting, both c.w. and 'phone; receiving; propagation; antennas; construction; theory; charts; diagrams; circuits; miscellaneous data; procedures; station operation, etc.

For instance, the 1952 Edition carries

- 7 Chapters on Theory: Electrical Laws and Circuits, Vacuum Tube Principles, High Frequency Communication, Antennas, Modulation, V.H.F. and U.H.F.
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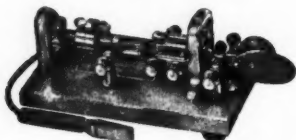
**The AMERICAN RADIO
RELAY LEAGUE, INC.**
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\$5.00 for your old BUG!

Regardless of model or age, we will allow you \$5 for your old Vibroplex in working condition toward any new, improved De Luxe model.

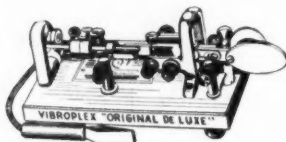
Just feel, and see, the difference!

Send your Bug and the balance to Harrison, NOW!



PRESENTATION MODEL

24 Karat gold-plated base top. New adjustable main spring gives wider range of speed than ever before. Polished chrome top parts. Beautiful red paddle. Here's a Bug that will really dress up your operating position! 29.95



VIBROPLEX ORIGINAL

Here's a real smooth operating Bug. Clean keying from ten wpm up. The Standard model has chrome top parts, black base. The De Luxe has chromium top and base plate, and jeweled movement. This is your chance to own the best!

STANDARD 'ORIGINAL' \$17.95
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VIBROPLEX CHAMPION

An excellent buy for your first Bug. All the features which have made the name Vibroplex famous. Flat pendulum vibrator. Adjustable speed control. Chrome finished top parts and black base. Less circuit closer, cord and wedge. \$12.95



VIBROPLEX CARRYING CASE
Protect your bug from dust, dirt and moisture. Cloth-lined case, finished in simulated leather. Complete with lock and key. \$5.75

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NEW HAMPSHIRE—SCM, Norman A. Chapman, WIJNC—RM: CRW. It is my sad duty to report the death of WIBHJ, Otto Halquist, Nashua. 8YGR, Toledo, Ohio, has received his W.N.H. certificate, No. 14, for working all ten New Hampshire counties. The Nashua Mike and Key Club held its Fourteenth Annual Banquet Party at Howard Johnson's in Nashua. Fifty OMs, YLs, and XYLs enjoyed the social gathering. George Hart, National Emergency Coordinator, gave an interesting talk on civil defense. KEX is on the air with a new Viking transmitter. BXU reports working HRIBG on 3.8-Mc. phone. TRM is working plenty of DX on 7 Mc. KBU, TDI, MCS, and JNC are members of the Transcontinental Phone Net. TTU and RMH have new 75A-2 receivers. TBS is our newly-appointed Asst. Route Manager. The following new Novice ticket-holders have been reported: UON, Farmington; UPI, Rochester; UGQ, Nashua; USK, Lebanon. We wish to welcome to New Hampshire, HS, Pembroke, and RAR, Farmington. BFT won the VE/W Contest Cup awarded by the Montreal Amateur Radio Assn. The Concord Brasspounders elected the following officers for 1952: CNX, pres.; RZD, vice-pres.; RMH, secy.-treas. Traffic: WIJNC 30, PFU 24, POK 22, JGI 9. **RHODE ISLAND**—SCM, Roy B. Fuller, WICJH—SEC: MIJ. RM: BBN. PAM: BFB. The Rhode Island Net (RIN) meets Mon. through Fri. at 1900 on 3540 kc. The Newport County Radio Club held its semi-annual elections. New officers are ULC, pres.; BBN, vice-pres.; TXF, secy.; TXL, treas. JFF, of the code and theory committee, reports nine new licensed members for the year 1951. At the annual election meeting of the Providence Radio Association, the following officers were elected: SIK, pres.; KCS, vice-pres.; Walter Butterfield, treas., licensed but no call; AEL, sec. secy.; SGA, corr. secy. The NAARO has initiated a radio course in cooperation with the State C.D. Authority to train personnel for communications. Traffic: WIBBN 45, OIK 13, TRX 12, CPV 5, HRC 4, TNX 3.

VERMONT—SCM, Raymond N. Flood, WIFPS—AXN reports TVI trouble. AVP has been reappointed Emergency Coordinator for Rutland County. We need (Continued on page 100)

FIRST VERMONT TO OUTSIDE QSO PARTY

The Tri-County Amateur Radio Club of Brattleboro, Vermont, announce their sponsorship of the First Vermont to Outside QSO Party and cordially invite all interested radio amateurs to participate. Here are the details:

(1) Time: 24-hour week-end period Saturday, April 26, 1952, 6 p.m., to Sunday, April 27, 1952, 6 p.m. EST.

(2) No time limit and no power restrictions.

(3) Scoring: Vermont stations count 1 point for each outside contact and multiply by number of ARRL Sections and foreign countries worked during contest period. Outside stations count 5 points for each Vermont QSO and multiply by number of counties in Vermont you work. Same station may be worked on other bands for extra score. Vermont stations may work one station in their section for section multiplier.

(4) Engraved certificates will be issued to highest scoring station in each ARRL section or foreign country in the following categories: 'phone only, c.w. only, combined 'phone and c.w. A prize to highest scoring Vermonter and a certificate to highest scorer in each county.

(5) The following frequencies are suggested to congregate near for this party: 1810, 3525, 3695, 3740, 3860, 7200, 14,100, 14,250, 27,000, 28,100, 28,800 kc.; 51, 145 and 221 Mc. Stations are urged to spread out near these frequencies to help keep QRM down and to allow some of our low pwr. stations to be heard.

(6) General Call: "CQ VT" on c.w.; "CQ Vermont QSO Party" for 'phone; Vermont call "CQ de (or call) VT K" for c.w., 'phones name your state.

(7) Contact Information Required: Outside stations: Send RST and ARRL Section. Vermont stations: Send RST and county.

Logs and scores must be postmarked not later than May 12, 1952, and should be mailed to: Ray N. Flood, SCM Vermont, 2 Marlboro Ave., Brattleboro, Vt.

Vermonters are especially anxious to help those who need Vermont for WAS so here's your chance. It is requested that the Novice band frequency of 3740 kc. be left to the Novices to enable them to join in without a pile-up of QRM. Other class licensees who wish to work with Novice stations should transmit near 3695 kc. and tune the Novice band.

SPRINGTIME IS ANTENNA TIME!



Proper selection of your antenna, and its **correct** adjustment, feed, and matching, can usually **at least double** your radiated power! For only a fraction of the cost of increasing your transmitter power you can buy the material and measuring equipment to do the job right (and far more easily).

As usual — Harrison has **everything** you need!

GRID DIP METERS

Look at the uses! Grid Dip Oscillator. Absorption Wavemeter. Signal Generator. Oscillating Detector. Check antenna frequency. Check circuit Q, etc. etc.

MILLEN 90531	\$61.50
LYSCO D11	29.95
ELDICO GDO (kit)	29.50

ANTENNASCOPE

Use in conjunction with GDO! Measure radiation resistance of antenna — impedance of transmission line — standing wave ratio — receiver input impedance.

ELDICO ANTENNASCOPE	\$24.95 (kit)
Wired and Tested	\$29.95

MICRO-MATCH

A necessity in the shack! Measure SWR. Measure RF power. Measure RF resistance. Check load impedance. Make sure of more RF in the antenna!

JONES MM-1 (open line)	\$32.50
JONES MM-2 (coax line)	\$41.25

SWR BRIDGE

Measure Stand-wave ratio easily — inexpensively with the Millen SWR Bridge. Another must in the shack!

MILLEN 90671	\$16.80
M.C. JONES meter for above	\$19.30

BEAM ROTATORS

Aim your beam for maximum results! Pin-point your signal on that rare DX. Here are the rotators to do the job right!

SMALL PROP-PITCH motors—converted	\$29.95
Step down xlmrs 115V to 30VAC	7.95
Seven conductor shielded cable WC-3	.09/ft.

RADIANT TELE-ROTOR

TR-1 (control light at end of rotation)	\$26.97
TR-2 (compass control rotator)	29.97
ALLIANCE ROTATOR — HIR —	\$26.97
Four conductor cable	2.96/C'

ANTENNA TOWERS

Get that beam up where it will do the most good! TRYLON mast towers can be made in ten foot sections up to 60 feet high! Really inexpensive!

TRYLON 10' mast sections	\$10.00
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MOBILE?

Naturally. HARRISON HAS IT!
Everything for the great outdoors!

HARRISON GP-10A

Looking for a really good Ground Plane antenna for 10 meters? Write for details on the new HARRISON GP-10A. All grounded construction for lightning safety. One-to-one standing wave ratio with RG-8 coax. Not low priced. BUT costs less than increasing transmitter power to reach those mobiles!



SHURE POLICE-TYPE CARBON MICROPHONE

Ideal for commercial and Amateur mobile xmits.
• Heavy duty push-to-talk switch for relay and mike circuits.
• Coiled Cord
• High output level
• Clear, crisp voice response

Model 102C complete with mounting bracket.	\$16.17
\$35.00 list price reduced only	

ANTENNA COUPLERS

Universal coupling of any conventional antenna regardless of impedance to any conventional tank circuit. Adds another tuned stage to your rig.

HARRISON AN-4 complete	\$27.75
ELDICO ANTENNA TUNER	21.95 (kit)
ANTENNA TUNER	29.95 (wired)
LYSCO Model 50	14.50

ANTENNA WIRE

Type	Your Price
#14 stranded	\$1.45/C'
#10 solid	3.30/C'
#10 COPPERWELD	3.42/C'
#12 COPPERWELD	2.37/C'
#14 COPPERWELD	1.47/C'
GONSET copperweld open wire line	\$9.70/C'
RG-8/U 52 ohms	16¢/ft.

SPECIAL!

Assorted lengths RG-11/U — 75 ohm coax rated at 1.5KW. Supplied to nearest available length up to 110 feet. 10¢/ft.

COAXIAL FITTINGS

83-13P (PL-259)	\$.59
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83-1J (junction)	.88
83-1T (T-connector)	1.59
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Transmitter/receiver control the easy way! Convenience of operation with instantaneous break-in. Ideal for contest work!

ADVANCE K1504RF (110VAC)	\$3.27
7200 (coax 110VAC)	9.98
7204 (extra DPDT contacts)	12.98

*Most every type of relay in stock, however, for fastest delivery, make sure to send us a DO! Free DO forms upon request! How many do you need?

TEN METER BEAMS

Here's the least expensive way of increasing radiated power. Hear the signals come up as you rotate! There's a directional array to fit every pocket!

HY-LITE PD-3E10 (all-grounded)	\$24.95
3E10T (including "T" Match)	41.80
WORKSHOP #29 (3-1/2' 10 Meters)	29.50
#29AD (dipole)	9.90

MOBILE ANTENNAS? HARRISON HAS THEM ALL!

MASTER MOBILE

Universal Body Mount — Model 132	\$9.75
Body Mount with Heavy Duty Spring — Model 132X	9.85
96" Tapered Steel Whip for 10 Meters — 100-96S	3.25
All-Band Antenna with coil for 20, 40 or 75	8.75
Extra coils for above — 20, 40 or 75 — Specify	3.30
New High-Efficiency Coaxial Antenna for 2 Meters. Fits all Master Mounts. 12' Coax Lead. Model 114	9.95

PREMAX

New Universal Ball Mount with Spring — Model RS	\$11.76
96" Step-Tapered Stainless Steel Whip — AS-196	3.65
Base-Loaded 2.5 MC Antenna with Coil — BLS-296	7.94
Center-Loaded 3.5 MC Antenna with Coil — BXC-396	9.12

WARD

Roof-Top Antenna for 140 to 160 MC. Install entirely from outside. Includes 12' coax lead. Model SFP-18. Here's the antenna that you've been reading about! Single 55¢/ft. whip for 10 or 2 meter mobile. Single hole mount. Fitting for coaxial connector. Full instructions. \$13.50

Write for new Master Mobile and Premax catalogs.

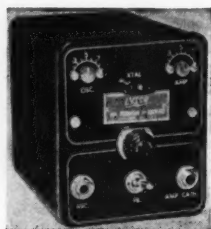


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**25 WATTS
PEAK POWER**

**CLAMP TUBE
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Here's a new line of mobile Amateur Units typical of Lyco engineering skill. Installed in beautiful rounded drawn case—black wrinkle finish with attractive silk screened front panel. Dimensions 4" wide x 4 1/2" high x 6" deep. Power input 500v DC, 125 ma. 6.3v AC/DC 1.35 Amps.

Mod.	Band	Tubes	Mod.	Band	Tubes
A-114T	20 M	3-6AQ5	A-129T	10 M	3-6AQ5
A-140T	160 M	3-6AQ5	A-175T	75 M	3-6AQ5

Any Model with tubes. Each.....\$33.55

MINIATURE VFO



Mobile or Fixed

*Good
Stability*

Series Tuned

*"Colpitts"
Oscillator*

*Illuminated
Dial*

Calibrated for 80, 40, 20 and 10 Meters. Output on 80 or 40 Meters. Power requirements 6.3V AC/DC; 1.35 Amps. 200V DC Max. 30 Ma. Tube complement: 6AK5 Osc, 6AK5 Buffer, 6AK5 Doubler.

MODEL 381—High impedance, 14" Ribbon Lead with plug for xtal socket. Amateur Net complete.....\$26.95

MODEL 381-R—Same as Mod. 381 except that it has Low Impedance, 15' Coax cable with remote tuned circuit on 80 or 40 meters. Amateur Net complete.....\$33.95

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4709 SHERIDAN ROAD, CHICAGO 40, ILLINOIS

new ECs for Orleans, Essex, and Lamoille Counties. A new club is getting under way in Rutland called the Rutland C.W. Radio Club. Meetings are held every Sunday night in the members' shacks. SNI, SDG, AVP, and TFB all have Viking Is. SPK is deputy commissioner for c.d. in Addison County. MH has received Extra Class ticket. The Tri-County ARC's Wednesday night radio class is going fine with 25 prospective hams cramming under WNITXN. Ann, OAK, has organized a slow-speed net for Vermont's Novices operating nightly on 3740 kc. Mon. through Fri. at 6:15 p.m. All are welcome, so please QNT. Traffic: WIOAK 148, RNA 106, FFS 57, AVF 56, IT 27, TAN 21, AXN 20, TXY 18, SPK 17, ELJ 10, KRIV 7.

NORTHWESTERN DIVISION

ALASKA—Acting SCM, J. W. Walden, KL7BK—A Novice activity is picking up all the time. W17AAK, AMQ, AJQ, and QWT are on nightly and AMS is building. Winds of more than 100 m.p.h. in Kodiak in January put most of the gang off the air for a while. AJQ is taking no more chances, and put his skywire back up with #8 copper-weld. The Anchorage Club station, AA, now is running 200 watts to 813. AA is running club-sponsored Code Proficiency Qualifying Runs the first Tuesday of each month at 9 p.m. on 3820 kc. W6FEW/KL7 is running code practice in Fairbanks on 3850 kc. EH has moved to Spokane where he will be working with v.h.f. gear. PJ is trying out his clamp-tube modulator. How about some reports? I can't write about what you're doing if I don't know. Congratulations to KL7AIZ on making BPL two months in a row. Traffic: KL7AIZ 639, YG 93, AN 5, UM 5.

IDAHO—SCM, Alan K. Ross, W7IWU—Burley: EC HAH reports VAC, MJZ, and HAH now able to check into the FARM and GEM Nets. MJZ is working on a home-built 3-band converter for 10-, 20-, and 75-meter mobile. Hayden Lake: EC FIS is figuring out a way to put a mobile in the Jeep. I would very much like to hear from some of you fellows who haven't written in before. Aberdeen: FBD has worked 111 countries but falls a few short of 100 cards for DXCC. Boise: The gang is going 144 Mc. nightly at 8 p.m. under the leadership of JKB, who is working on standardizing a portable rig for c.d. and other users for 144 Mc. OCR, ORJ, FOF, PKA, DOH, JKB, HRT, IWU, and AHS are active in Boise on 144 Mc. The Nampa gang consists of IYG, GPM, and PIT. We urge hams in the outlying area to get on 144 Mc. and join the fun. Who will be the first in the Magic Valley Area to contact this area? Traffic: W7NH 332, GHT 80, FIS 14, LQU 5, IWU 4.

MONTANA—SCM, Edward G. Brown, W7KGJ—COH, BSU, and KGJ reported active in the recent CD Contest. BNU is vacationing in Arizona and California. Deck plans to visit many of the local boys on his return trip. FEE, after having parasitic trouble, has gone back to single 807s. BSU has constructed a combination wave-meter and micromatch and says it works swell. Elmer has been having wind and antenna trouble. PX and OHS are on 3.8-Mc. 'phone. PGF is on 160 meters. SAW took a trip by air to several eastern cities. OPM is planning a bigger rig. LCM has his call on a sign board near Huntley. Our guess is that he will have many persons QSOs with touring hams this summer. Two boys from Butte working for the Monatan Power Co. have been working on the power-line noise in Billings. Montana amateur news now is appearing in the *Pacific Area Net News*. Anyone wishing to obtain this newsy paper of western goings-on should contact or write Vic Gish, W7FIX. We are anxious to receive reports on Novice activities. Traffic: W7KGJ 148, CT 26, CVQ 16, COH 7, BNU 5, PX 1.

OREGON—SCM, J. E. Roden, W7MQ—MWW, of Medford, now is Silent Key, and will be greatly missed by the boys in that section of the State. HDN states he soon will be active on the ham bands again. New officers of the Rogue Valley Radio Club are ISK, pres.; NOL, vice-pres.; LNG, secy. QMK is a new Novice, LVN reports much work and progress in Eugene, looking forward to the OARA Convention in late April. PRA is a new AREC member in Oregon City and much interested in emergency work. QGM is a new Novice from Baker. AWE is building a new kw. rig. LT is on his way from Singapore to Japan. KTC got in his December report on traffic too late to list; he had a fine total of 221. MTT is busy building a ten-element 2-meter beam. PHM is busy reorganizing the Pendleton gang into an efficient 10-meter bunch, especially the mobiles. HIBO reports that the La Grande gang is wondering as to the whereabouts of CHN, formerly of that City. APF has been carrying the brunt of the burden in supplying Net CQ for the OGN 'phone net. Because of skip conditions, Don is about the most-heard station and is making use of that fact. ESJ, Oregon's top OO, sends out reports to the fellows out of bounds and gets some very favorable thank-yous and replies. Because of very poor radio conditions, mostly QSB, the traffic reports as well as station activities reports are quite scanty this month. Traffic: W7H 40, R 27, MQ 101, AWT 61, GWE 58, GJN 30, FY 30, HDN 20, KTG 18, HJU 17, EUG 14, TH 14, DZT 12, NFU 5, PKG 5.

WASHINGTON—SCM, Laurence M. Sebring, W7CZY—SEC: BTY, RM: FIX, PAM: NRB. DND is rebuilding
(Continued on page 102)

GET THIS

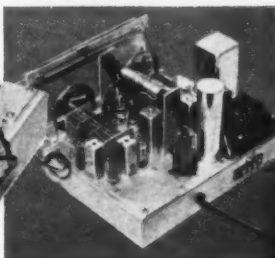
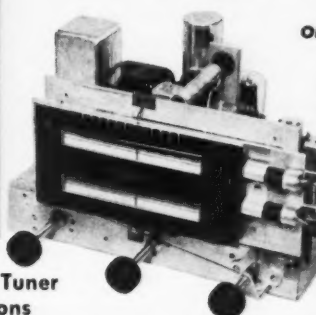
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Best Buy in Hi-Fi

New Pilot AF-605 Hi-Fi AM-FM Tuner

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Lowest Cost High-Quality Tuner Ideal for Custom Installations

The new Pilot AF-605 Tuner provides splendid reception of standard AM broadcasts and the 88-108 mc FM band. Features flat response within 2 db from 20-15,000 cps, with low distortion and high signal-handling ability. Has relatively low output impedance to minimize high frequency attenuation in output cable. Includes inputs for phono and TV, controlled by band switch. With slide-rule dial (each band separately illuminated); separate 3-gang tuning condensers for AM and FM; provision for outside AM and FM antennas; self-contained power supply.

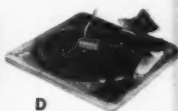
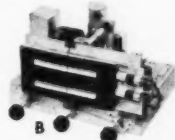
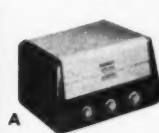
FM Features: Tuned RF stage for maximum sensitivity and selectivity; built-in line; antenna temper-

ature-compensated oscillator; ratio detector with 225 kc wide linear response; IF response 200 kc wide at 6 db points; 300 ohm balanced input to antenna coil with electro-static shield.

AM Features: Tuned RF stage; built-in high efficiency new "ceramic loop stick" iron-core antenna; IF wave trap; IF response 7.5 kc wide at 6 db points; separate diode for AVC voltage.

Pilot AF-605 Tuner Complete. Chassis size, 11 1/2 x 6 x 9". For 110-120 volt, 50-60 cycle A.C. Complete with 9 miniature type tubes and rectifier. Shpg. wt., 8 1/2 lbs. 97-944. **ALLIED'S** low price only \$42.95

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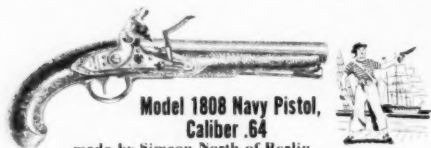
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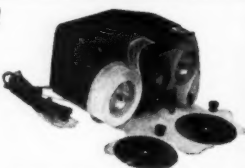
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NEW JERSEY



the rig and will be back on the air soon. PGY has a new Eimac 10-20-80 for all-land mobile. OZG has new pole and double Lazy H on 28 Mc. erected at the raising bee. The bee included OEX, BA, and PGY. KZP is on the air with a 1-watt "Cigarette Package" transmitter — 75-meter (phone) OEX now is NCS for 28-Mc. Totem Emergency Net. KL7DJ now is W7EKL. Officers of the new Lake Washington Club are PHV, pres.; DZO, vice-pres.; MEA, secy. DZO and PWO are having unusually fine results on 28 Mc. with cubical quads. KZP, CBE, FTR, and MSI are getting the North End Club generator in fine shape for Field Day. The local gang put up a new Trylon tower for MEU. PIO has a new Globe Champion. AWG hopes to get new 813 final on soon. KTL's mobile rig would not fit into new car. The welcome mat is out to the following new hams around Walla Walla: WN7QLK, WN7QLY, WN7QPI, WN7QNZ, W7QQA, and W7QOB. FWD has changed Novice code practice from 3.5 to 7 Mc. It goes on twice daily, Mon.-Fri. KNV reports lots of 144-Mc. activity in Tacoma, including CMX, KNV, KLG, NEY, N7PQR, HPJ, HMJ, and IJZ. BYK expects to have 3.8-, 28- and 50-Mc. mobile rig going soon, bandswitching two rocks on 3.8, two on 28, and one on 50 Mc. FIX is busy working on a new rig. BTY has new Johnson Viking about ready to go on the air. EMP is doing wonders in the field of audio. GJU and PFZ are busy chasing DX. PHP has a BC-458 on 3.5 Mc. Another Novice is WN7QGB. MTX is wiring up a HY60 in a mobile 28-Mc. transmitter. QIH is building a 6AG7/832A rig for 28 Mc. NDO is established in his new home since returning from the Far East. JJK is on his way to Texas. IYU still is QRL with the electronics department at Bremerton. NNQ is chief engineer at the local b.e. station. HMQ is back on his feet again after spending three months in bed with a serious heart ailment. CO is no busy putting in radars that he has had no time to ham. 6GPK/7 has been putting out propagation forecasts on the Totem Net each week. Traffic: W7IOQ 959, CZY 722, BA 345, EVI 229, TH 218, LFA 156, FIX 111, AWG 87, KCU 73, AIB 55, EHH 49, FRU 49, NWP 44, FWD 39, PGY 33, W6AJM/7 17, W7ETO 15, EVW 9, KTL 8, AVM 7, NRB 3, MTU 2.

PACIFIC DIVISION

NEVADA — SCM, Carroll W. Short, jr., W7BVZ — SEC: JU, ECs: HJ, JLM, JVW, KIO, KOA, MBQ, TJY, VO, and ZT, RM: PST, OPS: JUO, OO: LGS, Nevada State frequencies are 3690, 7225, and 29,360 kc. Newest Novice in Ely is QVF. He was trained by NRU, NWU skeds BVZ daily on 7225 kc. Novice QIH is on 3720 kc. from Boulder City; he bought JUO's Bretting. OQK has Advanced Class license now. JUO received Certificate No. 8 for Working 25 Nevada Stations. BKS got No. 9 and SXD No. 10. QNN is on the air from Nellis AFB. QLL is the newest Novice in Reno and has applied for AREC membership. JU made WAS on 3.5 Mc. TJY is handling traffic from Japan. BWX dropped food and a portable rig to KJD when George and other miners were marooned in a Northern Nevada snowstorm. The Southern Nevada Club enjoyed a visit to the MARS station at Nellis AFB in January. Meet your SCM daytimes on 7225 kc. Traffic: W7JU 26.

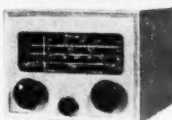
SANTA CLARA VALLEY — SCM, Roy I. Cousin, W6LZL — Many meetings formulating plans to combat TVI are being held, and have been held, and the results are up to the hams as individuals. Their problems are what the committees will work on to come to a happy conclusion. AEV, our SEC, sent in a fine report as usual and says that c.d. activity is showing new life. MXO moved from Lomita Park to San Mateo. DPE is back on 3.5-Mc. c.w. with a new 807 final and is rebuilding his 160-meter rig. NBD now is on 144 Mc. with 522 in San Bruno. WMM is getting the 144-Mc. bug and converted surplus gear for receiver, also put up square corner reflector. JIV, formerly of South San Francisco, now is on from new QTH in Colorado and holds skeds with QIE on 7 Mc. NW reports that he still has a very limited amount of time to get on nets. YHM reports he has been off the air for a couple of months fighting TVI but he hopes to be back in the circle again soon. RFF reports he is out of the Navy and back on the air again. BPT turned in another fine traffic report. The SCCAIA had a round-table discussion on TVI at its January meeting and RNG gave a very interesting talk on the problems of TVI elimination. Lt. Comdr. Taylor spoke on decontamination after an atom attack at the first meeting of the NPEC. The second meeting was held to a business meeting. I would like to hear from the rest of the club to add their activities to this report. Traffic: W6BPT 521, HC 146, NW 18, YHM 16, MMG 12.

EAST BAY — SCM, Ray H. Cornell, W6JZ — Asst. SCM, Guy Black, 6RLB, SEC: RVC, RM: IPW, PAM: KZF, ECs: TCU, AKB, QDE, IDY. The first meeting of the new section officers was held at the Oakland Radio Club, Red Cross Bldg., Jan. 31st. JZ, RLB, RVC, IPW, TCU, AKB, QDE, KZF, YHQ, WGM, and HOR attended. Implementation of AREC/c.d. plans was discussed. KZF has been appointed PAM and has started a 'phone net on 3900 kc., meeting at 1030 Sunday mornings. Implementation of the FCC plan for TVI is under way in this section.

(Continued on page 104)

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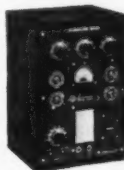
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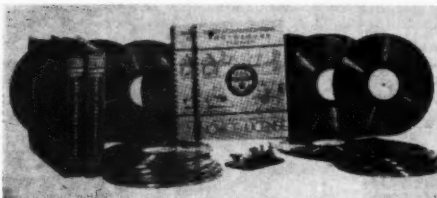
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Talent and resources are being marshalled. RLB is the spark-plug. The Mt. Diablo Emergency Net meets Mondays at 2100 on 29.6 Mc. TCU is EC and YHQ his assistant for that area. IPW has been appointed a director of RN6. He is making good progress with the section net. RVC recently completed a two-week course in a.d. given by ECDA at Saint Mary's College. He and LGW staged a 10-meter demonstration for the c.d. boys. Harry uses LGW TV antenna for a top-loaded radiator for 'phone even when TV programs are in progress. LGW is chasing TV Indians. The NBARA Emergency Net meets Tuesdays at 1900 on 28.62 Mc. WGM is EC. HOR and JCG were awarded the first Section Net certificates. YDI checks in regularly to MTN. RLB is working on mobile rig and Region 3 c.d. problems. ENF left for Boston, where he hopes to be reassigned WIBSY. UYX and LDD really were slugging it out in the 'phone section of the DX Contest. HOR reports his all-band antenna is working FB. He has worked 45 out of 58 California counties. The CCRC February meeting was held at the QTH of LGW in Alamo, Pacific Division Convention plans and TVI organization were the principal items discussed. Recently-elected officers of the Northern California DX Club are SR, pres.; MVQ, vice-pres.; KEK, secy.-treas.; CTL and NIG, directors. The Northern and Southern California DX Clubs held their annual joint meeting in Fresno Jan. 19th and 20th. In spite of "unusually" inclement weather and poor traveling conditions 72 DXers were in attendance. Among those present were: 3A2AB and W2IOP. W8IOP, LDD is planning to move to one of the more desirable hilltop QTHs. MHB is having a lot of fun and is knocking off some DX on 3.5 Mc. John is one of the few hams hereabouts who boasts a ground plane on this band. CTL has his new hand-pans excited working FB on all bands. Traffic: W6IWP 219, JZ 209, HOR 134, RLB 8, YDI 5.

SAN FRANCISCO — SCM, R. F. Czeikowitz, W6ATO — Phone JU 7-5561, SEC: 6NL, Phone: PL 5-6457. YOUR HELP IS NEEDED. In order to effectively combat TVI a TVI committee has been formed for the San Francisco Area. This committee will investigate complaints turned over to it by the FCC, and will handle to a conclusion with either the complainant if his TV set is at fault, or the amateur if he is radiating excessive harmonics. Reports will be rendered the FCC on the conclusion of each case. A publicity campaign is planned, including in its scope appeals and information to the TV listener, the amateur, and the serviceman for cooperation in this extensive program. The committee is temporarily headed by ATO. YOU CAN HELP YOURSELF, YOUR FELLOW AMATEUR, AND THE PUBLIC BY BEING PUBLIC-SPRITED ENOUGH TO VOLUNTEER FOR THIS COMMITTEE. The work is expected to be divided among several committees of three members each, and should require no more than one evening a week for each member. We need several amateurs with certain abilities for certain jobs, regardless of their capabilities in other fields. For instance, we need three men who can talk interestingly and intelligently and who can make a good impression on the public. Likewise, we need several volunteers with practical knowledge of TVI-elimination measures, as well as three technicians who may be called on only in cases of extreme unusual TVI conditions, or as a board to suggest the proper remedies to apply to an amateur station causing HARMONIC TVI. Several all-around helpers are needed. The S.F. committee now numbers eight, including DZN. IN ANY EVENT, EVERY AMATEUR WHO FINDS HIMSELF WITH SERIOUS NEIGHBORHOOD UNFRIENDLINESS FROM TVI SHOULD PHONE THE COMMITTEE TO INVESTIGATE THE TROUBLE before it becomes much worse and reaches the FCC in a mass of formal complaints. Phone JU 7-5561 AND VOLUNTEER NOW. RCA has, on a national basis, agreed that the RCA Service Company will provide FREE both the labor and the Drake high-pass filter to any RCA set found guilty of fundamental blocking, as long as the set itself is in good working condition otherwise, with sufficient signal strength for at least a fair picture, with an outside TV antenna, and in a service area. (In this Area FCC says the service area for TV is forty miles in all directions from Treasure Island.) Complaints of fundamental blocking to RCA sets should be made to the committee, which will handle by letter with the local RCA Co. Full particulars should be given. SO THE ODDS ARE SWINGING IN OUR FAVOR — SIGN UP TODAY. The c.d. programs are progressing favorably under the various ECs. The East Bay Net and the Bay Area Net are in full swing, with SWP, JCG, UEV, and JWF handling traffic with these, and with the regulars, RN6 and Mission Trail. SFRC meets the 4th Fri., 1641 Taraval St., San Francisco. HAMS meet the 2nd Fri., 1625 Van Ness Ave., San Francisco. Marin RAC meets the 2nd Fri., American Legion Hall, Larkspur. Tamalpais RC meets the 3rd Fri., OZC, VistaZoo near Centro Este, Tiburon. Sonoma Co. RAC meets the 1st Wed., Grace Bros. Brewery, 2nd St. west of Freeway, Santa Rosa. Humboldt ARC meets the 2nd and 4th Fri., YMCA Rooms, Mun. Aud., "E" St. Eureka. Traffic: W6SWP 60, JCG 43, ATO 4, UEV 1.

SACRAMENTO VALLEY — Acting SCM, Willie van de Kamp, W6CKV — Northern Area: Asst. SCM, Edward (Continued on page 106)



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M. Cripps, 6YNM. No reports were received from this Area. Central Area: Asst. SCM, Willie van de Kamp, 6CKV. GUV has a new SX-71. KXD was on with emergency power during the big snowstorm. QEJ lost 20-meter beam in the high wind. BHV is mobile on 160 meters. The Chico Area C.D. Net meets every Monday at 8:00 p.m. on 1920 kc. ASE paid the Acting SCM a visit while mobilizing through Chico on 28 Mc. CZV is heard occasionally. KRX conducts code classes week nights on 28.8 Mc. AYU was isolated for five days without power during the snow storm. AF helped keep FGW on the air during the emergency. Southern Area: Asst. SCM, Richard M. Hall, 6ZYV. New officers of the SARG are ZWZ, pres.; ILZ, vice-pres.; Hal Iverson, secy.; QKT, treas.; AK, Club rep.; GQS, sgt. at arms. New and prospective amateurs are cordially invited to attend. There is lots of action on 160 meters for c.d. director in this Area. AUO is heard nightly on 144 Mc. AVK is back on 28 Mc. after a long lay-off. SOB is deactivating receiver and transmitter. ILZ received Advanced Class license and is mobile on 28 Mc. Traffic: W6JDN 74, ZYV 44, KRX 23, ILZ 12.

SAN JOAQUIN VALLEY—SCM, E. Howard Hale, W6FYM—Reports for last month were so few and so late that I sent nothing in for December but will incorporate them in this month's report. W6VRF/M/KFAJ were instrumental in the rescue of two injured Air Force personnel at Keeler, Calif., Jan. 16th. Two new appointments in the section were EXH as RM and IAZ as OPS. Vic replaces JQB as RM. Thanks to Al for the FB job he did as RM and in organizing SJVN on 3525 kc. The Kern County Radio Club, Inc., now is officially an ARRL affiliate. YVP and his XYL have a new son, Bill, jr. Al is on 144 Mc. at Lodi with 32 elements 65 feet up. The Force Club has set its annual hamfest date for May 3rd. JPU, EC for Fresno, has scheduled an emergency test wherein the participants will receive only one hour's notice to meet at a certain location with their portable and mobile set-ups. W6OWO is a new call at Woodlake. W6VRF/KFAJ made BPL for December. New calls include W6BDCY, W6BZT, and W6DHS. NGR, Tulare, and EFS, Armona, are active on 144 Mc. Al Simms, of the Modesto Police Dept. has received his call, W6KFFJ. Keep sending in those reports, gang, but get them to me before the 7th of the month. Check in on SJVN on 3525 kc. Mon. through Fri. at 1900. Traffic: (Jan.) W6GRO 138, EXH 126, IAZ 68, JQB 67, GIW 30, QUE 13, FYM 3. (Dec.) W6VRF/KFAJ 700, W6EXH 331, IAZ 128, GIW 26, HZE 26, QUE 12.

ROANOKE DIVISION

NORTH CAROLINA—SCM, J. C. Genslen, W4DLX—EGF, High Point, passed away Jan. 19th. He was well liked and admired by the North Carolina gang for his cheerfulness, courage, and accomplishments despite the fact that he was confined to a wheel chair. LPL and his XYL, MDM, of Fayetteville, have a new jr. operator. From Hamlet REU reports the Sandhill Club now has the call UBT, and is on with a 300-watt rig. A new Novice in the Club is W4UNK. ROO is on 75 meters with clamp-tube job. RRRH says he can't find time to eat because of traffic net skeds. Charlotte was represented in the CD Party by OQQ and DLX, and BDU says DX kept answering his CQ CDs. BBZ sends a nice report from the Wilmington Area. The gang there held a big oyster roast and only one ham was absent. SVY, who had to work. BBZ, RIL, SVY, and NTB are active on 28-Mc. 'phone and say they are getting good results on short skip. RIL, ex-OQSAE, holds almost daily skeds with the Congo. HBQ is active on 28 Mc. in Goldsboro. CDQ, of Gastonia, reports the gang there put on a Whiz-Bang radio demonstration during the recent Polio Drive and collected more than \$3000. The c.d. and CAP, taxi and police radio were all tied in on it. Those fellows really put on a well-planned and smoothly-executed operation. Congrats, boys. SVD reports the North Carolina 10-meter 'Phone Net is going well in spite of poor conditions. SGD is collecting mobile QSL cards. Traffic: W4MHM 150, BDU 90, ONM 56, RRRH 30, CVQ 16, JPY 14, CGL 13, KAZ 13, DLX 10, NYN 8, RH8 8, BAW 7, BBZ 4.

SOUTH CAROLINA—SCM, T. Hunter Wood, W1ANK—DCE reports that the Dupont ARC is losing members faster than gaining, but new members W4UOR, Paul Nance, and Don Barnum are new operators at THR. FFH is recovering from an eye operation and is back on 3.8 Mc. VN has complete emergency rig near Charleston on 3.5-Mc. c.w. YQS, BLZ, RXO, AYE, MRD, DCE, and Paul Nance met for breakfast Jan. 27th with 6 mobiles present. TOJ is on 7 Mc. from Loundsville. MCY has moved to Churchland, Va. OGG is in Norfolk awaiting transportation overseas and operating K4AIR. A club was organized at the Charleston Naval Shipyard on Jan. 29th with 27 members present. Officers are DNE, pres.; Paul White, vice-pres.; RXO, secy., and treas.; MRD, DCE, and SSN is on 14 Mc. from Anderson. W4AUK is new on 3.7 Mc. from Greenville. DX, AZT, EDQ, and SBT met in Augusta on Jan. 23rd. A South Carolina Novice net is being organized on 3740 kc. All interested WNs, drop a card to the SCM. Traffic: W4ANK 332, CHD 41, AZT 8, DX 6.

(Continued on page 108)



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DEPENDABILITY

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Stacked dubl vee with Q bar	8.71
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#14 enamel, 100 ft. coil	.95
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3 1/2 x 19 alum. panel (black or gray)	.94
5 1/4 x 19 alum. panel (gray only)	1.29

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6x6x6	1.10
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8x17x3	2.03
10x17x2	1.91
10x17x3	2.20
11x17x3	2.29
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441 3 x 5 1/8 x 2 1/8	1.05
440 4 x 5 x 3	1.08
442 5 x 6 x 4	1.33
443 5 x 7 x 3	1.49
447 5 x 17 x 4	3.75
444 6 x 8 x 3 1/2	2.18
445 6 x 10 x 3 1/2	2.69
446 7 x 12 x 4	3.19

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221K	V.T.V.M.	25.95
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	(De luxe)	39.95
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322K	Signal Generator	23.95
360K	Sweep Generator	34.95
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	(Push-Pull 5" Scope)	8.95
425K	5" P.P. Scope	44.95
511K	Multitester	14.95
526K	1000 ohm per volt	
	Multimeter	13.90
555K	20,000 ohm per volt	
	Multimeter	29.95
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950K	Resistance Capacitance	
	(Bridge & R.C.L. Comp.)	19.95
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Type No.	Sec. Volts	Sec. Amp.	Insulation Volts	Dimensions			List Price
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P-2939	2.5 c.t.	5	2500	2	3 1/4	1 1/8	\$2.30
P-2940	2.5 c.t.	10	7500	3	3 1/8	2 1/4	3.38
P-3042	2.5 c.t.	10	10000	2 3/4	3 1/8	2 1/4	3.48
P-3040	5 c.t.	3	2500	2	3 1/8	2 1/4	2.90
P-2941	5 c.t.	6	2500	2 1/4	3 1/8	1 1/8	2.94
P-2942	5 c.t.	12	2500	3 1/8	2 1/8	2 1/4	4.86
P-2943	5 c.t.	30	2500	3 1/8	3 1/8	3	6.47
P-2944	6.3 c.t.	1	2500	1 1/8	2 1/8	1 1/8	1.66
*P-3074	6.3	1.2	5000	2	3 1/4	2	2.12
P-2945	6.3 c.t.	2	2500	2	3 1/8	1 1/8	2.12
P-2946	6.3 c.t.	3	2500	2	3 1/8	1 1/8	2.50
P-2947	6.3 c.t.	6	2500	3	3 1/8	2 1/4	3.24
P-2948	6.3 c.t.	10	2500	3 1/8	2 1/8	2 1/4	4.41
P-2960	7.5 c.t.	4	2500	2 1/8	3 1/8	1 1/8	2.94
P-2961	6.3 c.t.	3	2500	3	3 1/8	2 1/4	4.86
	6.3 c.t.	3					
P-3041	5 c.t.	3	2500	2 1/8	4	2 1/8	4.86
	6.3 c.t.	3.6					
P-3143	7.5 c.t.	8	2500	3 1/8	2 1/8	3 1/8	5.00
P-3145	10 c.t.	5	2500	3 1/8	2 1/8	3	5.00
P-3146	10 c.t.	10	3000	3 1/8	3 1/8	3 1/8	5.88
P-2959	12.6 c.t.	2	2500	2	3 1/8	1 1/8	2.65
P-2962	25.2 c.t.	1	2500	2	3 1/8	1 1/8	2.65
P-2963	12.6	7	2500	3 1/8	2 1/8	3 1/8	5.88
	or						
	25.2	3.5					

*Indicates TV Replacements.

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O.D.	I.D.	WALL	PRICE
1/4	1/8	.062	\$.07
5/16	3/16	.062	.10
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1/2	3/8	.062	.18
5/8	1/2	.062	.23
3/4	5/8	.062	.29
1	7/8	.062	.38
1 1/2	1 1/4	.125	1.13
2	1 3/4	.125	1.50

ROD 12" LENGTHS

O.D.	Price	O.D.	Price
1/8	\$.03	3/4	\$.80
3/16	.06	7/8	1.15
1/4	.10	1	1.55
5/16	.16	1 1/4	2.30
3/8	.21	1 1/2	3.30
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- FULL TWO-WATT ANTENNA OUTPUT*
- Weighs only 14 pounds!
- Complete, self-contained 2-way radio-telephone station!
- Rugged, weatherproof
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HT-21 (25-50 Mc.)
HT-22 (150-174 Mc.)

*On 25-50 Mc.
One watt output
on 150-174 Mc.



CENTRAL STATION

HT-23 (25-50 Mc.) HT-24 (150-174 Mc.)

Same performance and specifications as the "Littlefone" Hand Carry

- AC-operated Central Station
- Audio-amplifier, providing one watt of audio for loudspeaker
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VIRGINIA — SCM, H. Edgar Lindauer, WAFB — SEC: NAD, RMA: MWH, IA, PXA, SDK, FV. Things really have been humming in the Virginia section, Norfolk and the Tidewater Area of that vicinity staged one of the best simulated emergency drills that has been witnessed for a long time. A total of 70 mobiles and 12 fixed stations responded to receive the plaudits of local e.d. officials as the best organized segment of the e.d. organization in that area. There are heavy rumblings from Richmond that indicate definite plans are underway to set the period in mid-October as the date for a Roanoke Division Convention, so you fellows can start making tentative plans to be present. FF is on 'phone with screen-modulated p.p. 813. Next month will find Virginia hams renegeing that QSO Party that stimulated interest for the past two years. Make your plans to participate. TFX, jr. operator at IA, reports that confirmation of WAS has been passed on to Headquarters for that certificate. All were worked during the period of the Novice license. The Shenandoah Valley Radio Club again is making whoopee toward a hamfest repeat of the last one at Sky Line Drive in June. KX is QNT VN with 4-watter VFO, Oct. 49 QST, and worked 46 stations and 21 sections in the CD Party. LPO, ISE, and LPP are working on antennas at new QTHs. CBO, former Roanoke Division Director, presently on 7 Mc., will be heard shortly on 3.8-Mc. 'phone. SMT applies his ham knowledge toward technician job at local b.c. station. RSS is the call of the Norfolk Naval Shipyard Amateur Radio Club, which skeds K4JAT on 14-Mc. 'phone and c.w. JUY is temporary DJ1LS, Heidelberg. RNP lives in an all-metal house. No TVI troubles, says he. Traffic: W4SHJ 250, MWH 179, FV 128, JAQ 112, PWX 110, FF 70, NAD 70, PXA 57, KFC 45, IA 40, NV 28, KSW 19, LK 13, IYI 12, RSS 7, KX 2.

WEST VIRGINIA — SCM: Donald B. Morris, W8JM — AUJ hits a tremendous total of traffic messages by work on the WVN, SRN, TEN, and ESN Nets. Bob also reports that BTV transmits ARRL Official Bulletins on 3770 kc. before the Net starts in an effort to keep the frequency clear. HZH, at Nitro, has new Viking and works WVN. LGB has been named EC for the Tri-City Radio Club. W8JDDH is the newest club member of the Tri-City group. EZR has had to reduce his operating because of illness. W8N1YG is a new station at Princeton. The Princeton gang is running into some TVI and is cooperating to clear the trouble. PZT reports good DX on 3.5-Mc. c.w. and recommended BWD for OPS appointment. W8N1ES and W8N1EV are man and wife, and W8N1YS is the brother of ICS. FMU '8, working from the Hobby Show in Elks Club at Morgantown, handled 329 messages. New officers of the Tri-City Radio Club are UYR, pres.; DHX, vice-pres.; Casdorff, secy.-treas.; and IRN, act. mgr. JHC enlisted in the Air Corps. BWK reports good activity on WVN Net. The MARA Club will be active from the Marion County Hobby Show in Fairmont on May 2nd, 3rd, and 4th, using the Club call, W8SP '8. Traffic: W8AUJ 976, FMU '8 329, BTV 93, BWK 74, YPR 72, PZT 17, DEC 8, GEP 8.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, M. W. Mitchell, W0IQZ — SEC: CKHQ, Asst. SEC: PGX, RMA: LZJ and ZJO. KHQ is getting to be a real traffic hound! He has the bugs worked out of his rig and it sounds FB. His brother, YCD, is on 160 meters with an 814. A new reporter this month is K0FAM from Lowry Field. This station sponsored the Lowry Amateur Club and is active in the DARN and DARC. YMP is overhauling his 20-meter beam hoping to get a little more DX. IA has his 2-meter rig going but all he hears is taxi, police, and other services, no hams! PNK spends most of his spare time shoveling out of the heavy snows. BXM comes through with a nice newsy letter of the doings of the El Paso Amateur Radio Club of Colorado Springs. The Club has sponsored several transmitter hunts, the last of which was won by HDI and KMS. HDI has new Viking and VFO. KMS is working on a super-hot 2-meter receiver. COF has a new mobile. CVG has new Tri-Band. NIP is rebuilding his rig for 14 Mc. WPK is wiring up new Viking. COZ and GBS are teaching a radio course at the Industrial School. They plan to turn out a lot of new WN licensees. BXM is working a lot of DX on 3.8 Mc. with a 4-wave vertical. COF has a new Viking and KMS. The National Bureau of Standards HF monitoring station on Cheyenne Mountain called in on a 10-meter round table and gave the Colorado Springs boys modulation and frequency reports. Traffic: W0KHQ 413, K0FAM 133, W0YMP 21, IA 12, PNK 4.

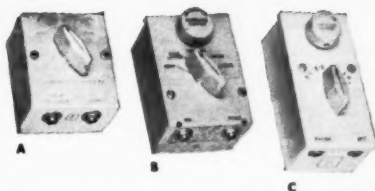
WYOMING — SCM, A. D. Gaddis, WTHNI — With the new year we have turned a new leaf toward moving traffic in Wyoming. PKX has taken the Route Manager job and, with LUV as ORS, plans for state traffic net are taking shape. W0EXK and AJJ moved to Laramie. KFV reports the Laramie Club is starting meetings again. GOH reports he has whopped his TVI. MIM, JDB is home from Guam. JXJ rebuilt exciter to simplify operation. MW is a granddaddy. PKX says there are three Novice licenses as a result of club efforts in Sheridan. BXS is on 3.8 Mc. AXG says HX is doing FB but still is in the hospital. Mrs.

(Continued on page 110)

LOOK STEINBERGS LOOK

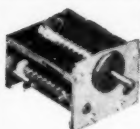
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- Weighs only 14 pounds!
- Complete, self-contained 2-way radio-telephone station!
- Rugged, weatherproof
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- 22 sub-miniature tubes on dual super heterodyne and phase modulated transmitter.



HAND CARRY

HT-21 (25-50 Mc.)
HT-22 (150-174 Mc.)
40w 25-50 Mc.
One watt output
on 150-174 Mc.



CENTRAL STATION

HT-23 (25-50 Mc.) HT-24 (150-174 Mc.)

Same performance and specifications as the "Littlefone" Hand Carry.

- AC-operated Central Station
- Audio-amplifier, providing one watt of audio for loudspeaker
- Power consumption is 35 watts
- Plugs in any AC outlet (117 Volts)

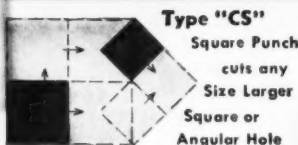
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1/8	\$3.25
3/16	\$3.50
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1	\$3.95

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1/8	
3/16	
1/4	
1	\$2.15

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1 1/8	
1 1/4	

Simple Hand Wrench Screw Action

1 1/16	\$2.30
1 1/8	
1 1/4	

Simple Hand Wrench Screw Action

1 1/16	\$2.60
1 1/8	\$2.95
1 1/4	\$3.65

Simple Hand Wrench Screw Action

1 1/16	\$2.60
1 1/8	\$2.95
1 1/4	\$3.65

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AMU now is Major Branson in the CAP. MVK, MWS, and OWZ still are on 144 Mc. in Cheyenne. IDO is gathering news of the Casper gang. Things are looking better — let's keep 'em rolling, gang. Traffic: W7PKX 111, LVU 13, HNI 5.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Dr. Arthur W. Woods, W4GJW — KIX has TVI-proofed four rigs to date. RTI has 40-watt suitcase rig and receiver. OAO soon will be on 10-meter mobile. PPK's dad is WN4UTI. BFM meets three amateur nets and two MARS nets. EJZ meets three nets and will be active in RACES. DD is looking for 6-meter QSOs. FIG, KCQ, ELX, KUX, and FSW have six states confirmed on 144 Mc. GET will have new Motorola mobile job. KNW is working 'em on 20-meter mobile. HCV is building converters for newcomers to 144 Mc. BCU is on 144 Mc. in Anniston. A Novice Net is in the planning stage, and probably will be on 3715 kc. DTI will move to Tennessee. New WN calls are USF, USP, UTH, UBQ, USI, and KN4NRS. Birmingham has a functioning TVI committee. EDR is rolling up a good DX total on 7 Mc. AENR soon will have 10-meter walkie-talkies to supplement its emergency preparedness. Traffic: W4EJZ 89, KIX 72, OAO 24, BFM 23, PPK 15, RTI 4.

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — The 3945-ke. net, OMN, FPC, SZL, and 8BIZ/4 are doing a bang-up job of rejuvenating the Palmetto (FN) Net on 3675 kc. Other members include ART, LMT, JGD, ARV, PZT, and FWZ. The first net bulletin from OMN brings out clearly the aims and needs of the net. All nets need your active participation at least one night per week. So — 3675 or 3945 kc. make it your meeting place. Clearwater: CDC has obtained the ex-police 2Kc. of Kc. net. transmitter to go along with its CDC license. MJU is in charge. Clewiston: How's this from PJU: "Due to health, traffic took a beating; due to traffic, health took a beating!" Dade City: SAS operated portable at the Pasco Fair and says "Sold one-tuber and have started new two-tuber."

Daytona Beach: RWM reports that OY is back on! Deland: FJI has a plenty snap as MO for the 2Kc. of Kc. net. WS passed the hundred traffic mark for the first time in 23 years. Jacksonville: DAA gave a nice talk on ham TV gear at the JARS meeting. Around Jacksonville there has been a big shift to 75-meter 'phone. HWA reports equally good results from his John Viking on 7 Mc. with his 3.5-Mc. coax-fed half-wave because of the pi tank cooperating on both bands. Miami: Channel traffic to the Swing Shift Net goes through SAT. Okeechobee: PZT now has five net affiliations, 'phone and c.w. Sarasota: LMT has six, 'phone and c.w. Sanford: WN4TRT is another Novice with a yen for a WN net. Tampa: WN4TYE also is hankering for a WN net and runs 75 watts. Umatilla: WN4TKD scored 1071 points in the Novice Contest. West Palm Beach: WN4TOP is the first WN MARS member. Our good DX contender, CKB, worked VU2EJ for his No. 150. St. Petersburg: The St. Petersburg Club had a booth at the Largo Fair on 3.8, 3.5, 28, and 144 Mc. coordinated with CDC demonstration set-up. The CDC call is KIAB3/1, with MUJ in charge. Traffic: W4LMT 542, PJU 302, OMN 198, PZT 180, WS 128, KJ 116, SAT 100, HWA 47, RWM 38, FWZ 30, SAS 28, WN4TYE 16, WN4RT 9, CKB 5, DES 2, UBM 1.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/RE — SEC: PQW. EC: PLE. GQM is building 813 final and Q5-er. NOX is heard regularly on 75-meter net. AGB has been heard from AOK. NN has moved farther west. Newest call: WN4UTB, WN4UYS, WN4UND, WN4TKL, now W4TKL, in active on 28 Mc. Nightly round tables at Panama City are TKK, TVD, TKC, FRQ, TJQ, SGG, FOX, MMA, and KYJ. UOZ reports to the SEC on his emergency equipment. TTM keeps the 10-meter band going in Pensacola. RZV is busy on 75 meters. Nightly round tables in Pensacola are UCY, PTK, FHQ, SZH, TTM, BFD, and BRC. ART is busy with traffic on 7 Mc. VR and MUX are on 7 Mc. BKQ has been heard on 28 Mc. DAO is having trouble with 12-year-old T-55s. ODO is adjusting Wallman. HJA has HT-9 going again. PTK has 75-meter mobile. PQW is looking for 144-Mc. skeds. UCB has mobile antenna farm. MS is rebuilding 14-Mc. beam. PAA still is striving for peak efficiency with 32V-2. SZH has NC-125. QK has Extra Class ticket. NYZ has been working 14 Mc. WN4UTB's XYL has her ticket. LUF was in CO-Land. GHP works 7 Mc. NQY has FB signal on 75 meters. Traffic: W4NOX 22, GQM 4, MS 3.

GEORGIA — SCM, James P. Born, jr., W4ZD — Our RM, OSE, has formed the Georgia Novice Net (GNN), which meets every Saturday at 1900 EST on 3735 kc. Novices interested in joining, please drop Ed a card at Box 672, Gainesville, or call in on the net. OCG has moved from Orlando, Fla., to Augusta, Ga., and is active on 3.5-, 7- and 14-Mc. c.w. with a 500-watt rig. WN4TDX and WN4USV are new hams in Savannah. KGP is rebuilding his rig. #KKS and LXR visited the Savannah Radio Club in January. POI has completed his mobile rig and is building a new VFO. MRB lost his 28-Mc. beam in the recent

(Continued on page 112)

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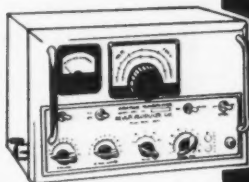
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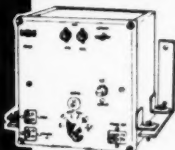
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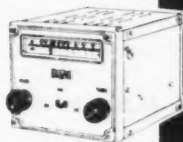
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For Fixed-Station use: Power Supply (117V-60 cycle, AC, 325V at 190 Ma, 6.3V at 6A) complete with tubes, stand-by switch and auxiliary outlet. PS-117, \$30

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- Complete, self-contained 2-way radio-telephone station!
- Rugged, weatherproof
- Powered by Dry or Wet Rechargeable Batteries (can be recharged from car battery or 117 Volts AC)

* 22 sub-miniature tubes on dual super heterodyne and phase modulated transmitter.



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HT-23 (25-50 Mc.) HT-24 (150-174 Mc.)
Same performance and specifications as the "Littlefone" Hand Carry.

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 - Power consumption is 35 watts
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high winds. RKK has returned to the air with a new 35-watt transmitter and is working 3.85-Mc. c.w. and 'phone. CFJ is building a new 1-kw. rig and has a new 5-inch 'scope for checking per cent modulation and signals. KFL has returned to Atlanta after a year in the Army and is on 7-Mc. c.w. It is with deep regret that we report the passing of KAD, of Atlanta. New appointments: As EC—BQU, for Bleckley County; OFT, for Cobb County; IPV, for Dougherty County; EYQ, for Fulton and DeKalb Counties; OHH, for Upson County. As OBS—NS, As ORS—KL and RZU. As OPS—NS, As OLS—KL and OHH. Endorsements: As EC—LXE, for Bibb County; KIZ, for Coffee County; IMQ, for Polk County. As ORS—MA, KFL, TO, As OPS—TO, HKA, LYG, ZD, NNM has a new harmonic—it's a girl and MTS is the grandfather. Traffic: K4WAR 894, W4KGP 98, RKK 50, ZD 44, POI 40, NS 37, ACH 34, OSE 29, EJC 19, FBH 17, MZO 9, MTS 8, MRB 2.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: ES, RD, a new ham in Manati, uses TBS-50A, HRO-50, and 10-20 beam atop 60-foot pole, and reports into AREC nets. PW is mostly on 28 Mc. since receiving General Class ticket. NX is rebuilding converters for 28, 50, and 144 Mc. HN is arranging stations with separate tables for h.f., v.h.f., and RFTY. AS, moving to Heights, NY has 10-over-20 beam, working FB; he reports on 3925-ke. net. KD renewed ORS appointment. JA is on the fourth year of weekly sked with CO2CB. Other COs who join the round table are CO2RV, NY, WV, GV, and LY. VP8SD, Barbados, reports regularly into 3925-ke. net, acting as NCS when KP4 conditions are poor across the island. KV4AQ, St. Croix, calls in on 3925-ke. occasionally. KV4AA, St. Thomas, is chasing DX for his DX column. KH6PO, KP4 built 150-watt transmitter and is on 28 Mc. LV put up 20-meter doublet and has deserted 28 Mc. DM bought a TBS-50. LQ is organizing CAP communications system with CP, ES, FJ, BQ, and BI in Ponce, CO and DG in Mayaguez. LQ and MV in San Juan. CAP airport stations are on 3.5-Mc. c.w. on 3925-ke. near Isla Grande, Ponce, Dorado, and St. Thomas. Traffic: KP4DJ 7.

CANAL ZONE—SCM, Everett R. Kimmel, KZ5AW—With a long line of mobiles opened up for inspection, TB's new mobile power unit purring away, and with music coming from an excellent PA system, the Crossroads Radio Club's Summit Garden picnic took on the appearance of an outdoor radio exhibit. Orchids to the Atlantic Side gang for a wonderful day. MARS Officer USARCIB SC (and AA) is being reassigned to the Pentagon. With him for new assignments go EIH, KO, and ST. EIH was the first KZ5 to take the Extra Class exam. ES, currently K84AQ, will return to the Isthmus soon, according to FJ, who works him daily on 3.5-Mc. c.w. PAM PC is piling up a nice log on stateside 75-meter 'phone worked in the early-morning hours. In a welter of ladders, ropes, sweat, grid-dippers, and antennascopes GF, RN, and WJ got up their new 20-meter three-element beams.

SOUTHWESTERN DIVISION

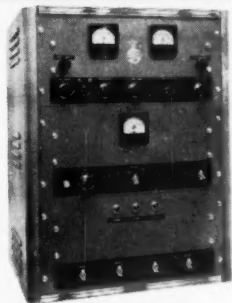
LOS ANGELES—SCM, Samuel A. Greenlee, W6ESR
L—SEC: KSX, PAM: PIB, RMs: CE, FYW. Section traffic nets: Mon. through Fri.—c.w.: So. Calif. Net. (SCN). 3605 kc. at 2030 (1st session, outgoing traffic, 1915). El Capitan Net (ECN). 3725 kc. at 1930. BPL this month was made by KYV, CE, GYH, GEB, WWT, and CMN. The performance of our boys in the recent snow and floods makes us all proud of our lobby. WWT, at Bishop, deserves special orchids for a magnificent job in "Operation Snowbound"; one hour after 'phone went out he had communications set-up and ham facilities were used around the clock for six days by Civil, State, and Military authorities. Among other things, was the effected rescue of 1200 marines snowbound in the mountains. Special mention also goes to the Mission Trail Net (3854 kc.) for their grand work during the crisis. Many of us listened spellbound to the fabulous job done by the Golden State Emergency Net (3965 kc.) in their 24-hour operations during the flood in the San Fernando Valley. The FB teamwork of their fixed and mobiles is credited with a huge saving of lives and property. "Well done" also, to the Greater net and the individuals who either acted or were standing by to help if needed. A low bow, gentlemen, for a thrilling performance. The section suffered a great loss in the passing of L. L. Strohl. Not a ham, but of, by, and for the ham. He will be sorely missed. We regret the resignation of LDR as Manager of SCN because of business. The new RM in charge, CE, announces GJP is Acting Net Manager and that the new frequency is 3605 kc. Climb aboard, fellows, SCN is rolling! GEB/6, at Crestline, strings antenna between snowmen, sezee. AM showed VIP around "Rancho Rhombic," the car got stuck in the mud—QRL, 3 hours, digging out. FKO is sporting a new 75A-2 and 200 watts and Class A. DDE has new rig at his office (FAE). CCF is on 75 meters. NCP and MJA are back in harness again after their recent illness. FMG coordinates traffic between American Legion and RN6. Watch for NZP M/M on 28 Mc. during So. American cruise on a freighter. BLY reports: FGC has new Viking; ZPC and AYI now are on (Continued on page 114)



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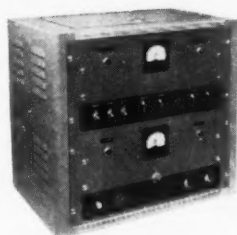
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More Watts Per Dollar
R. F. Section a complete 165 watt XMTR. Provisions for ECO. Automatic fixed bias on Final and Buffer. Class B Speech Modulator. 165 watt input—10 thru 160 meter bands. Complete with tubes, meters, and one set of coils. Low Down Payments.

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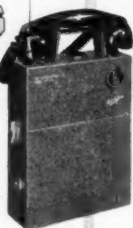
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- 22 sub-miniature tubes on dual super heterodyne and phase modulated transmitter.



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HT-21 (25-50 Mc.)
HT-22 (150-174 Mc.)

*On 25-50 Mc.
One watt output
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75 meters and LVQ licked 28-Mc. TVI with new transmitter. Thanks, Ira. OHX is helping with ECN. K6EA is back on 80-meter c.w. Congratulations to GYH on making HPL 19 successive months. This month marks FYW's 49th consecutive report. KGC, president of L.A. Council of RC, wants suggestions or help on new TVI Committee. KOY finally got into the traffic game. WN news: NIE and NJU are very active in c.d.; NTE suggests hams near WN sub-band listen for WN calls. Club doings: Long Beach, KEB pres., staged a tip-top equipment auction; I20 bid like mad! Whittier 50, (E.A. pres.), held a big banquet and installation of officers. New members: AYI, AXH, ECM, FCC, KJT (ex-KH6UT), and LMI. New club—The South Bay RC is being organized with UVD, acting pres. Santa Barbara—KCG has been reelected pres. Compton RC—UQQ has been elected pres. YLRC, CEE, pres., will issue "Lad'n Lassic" certificate to OMs who QSO 20 or more members this year. Call AYI, secy., for more information. The Two Meters and Down Club, VBG, pres., continues sponsoring v.h.f. activity. It is a live, fast-growing club. Thanks, also, for the reports: CIX, COZ, EPL, IOX, MU, PIB, WSV, YSK. Traffic: W6KYV 2025, CE 1804, GYH 809, GEB 503, CMN 332, WWT 260, HLZ 128, PMS 108, NCP 81, FMG 07, GTP 67, BHG 53, FES 31, CK 29, I20 26, ESR 25, ODE 23, BLY 21, MJA 14, AM 8, KOY 7, EBM 5, OHX 5, COF 4, FAE 4, KXS 2, BUK 1, WNGNJU 1.

ARIZONA—SCM, Jim Kennedy, W7MID—A new Novice in Tucson is Lenfest, W7NQQ. A transition in the record time of 26 days from Novice to General Class was made by Caudill, QEG, QFP is building a 4-65A rig. OZO now is JAZOM. An interference committee for the Tucson Area is headed by HUV, assisted by OEN, ØBDO, LAD, NYT, OZM, and 5RDB. LAD is building a de-TVled rig ending up with a TZ-40, 6APW/7 departed for W2-Land, and was given a going-away party at LAD's. LVR still is looking for Vermont to complete his WAS on c.w. The parents of OMO both took their Novice Class exams in L.A. in January, which should make them a cordy ham family. Ground plane antennas for 28 Mc. are becoming popular in both Tucson and Phoenix for local work and for mobile contacts. K7FAG has a new three-element beam fifty feet up. UPF soon will be modulating his gallon on 14 Mc. NRE is in Biloxi for a spell. LZP and NNG are sharing a new TB-50. Congrats to MWQ on passing his Extra Class exam, and to PGX on his entry into the DXCC. PUM and PGX both posted hot scores in the SS Contest. Traffic: K7FAG 855, W7JGZ 18.

SAN DIEGO—SCM, Mrs. Ellen White, W6YYM—Asst. SCMs: Shelley E. Trotter, 6BAM; Richard E. Huddleston, 6DLN; Thomas H. Wells, 6EWU. SEC: NBJ, RM: IZG, ECN: DEY and IOK. Local members of the AREC now are being signed up with c.d. officials. Fresno County Emergency Net now is being operated on 29.52 and 3.997 Mc. San Diego's own traffic operator, ELQ, has undertaken the terrific job of managing RN6. TZB, of El Toro, is a new ORS in the section. New appointments as OES have gone to DVJ, OCY, and ODB. W6N10 racked up over 3000 points in the recent Novice Roundup, after losing his 80-meter half-wave vertical across a high voltage power line. There is a new Novice club at the Vista High School which meets at 7:30 on Thursdays. The S.D. YLRL held a luncheon Feb. 9th attended by 24 YLs, including FEA from Fresno and a VE3. NSJ is planning a mobile 7-Mc. rig. 8CPI 6 is back from Korea and expects to be on the air in Garden Grove before long. Bam keeps up there in the HPL with a January traffic total of 836. OCY is constructing a parabolic reflector with a yagi-driven element for 420 Mc. QKY reports the El Centro gang turned out for a big dinner in Mexicali Feb. 14th. Another member of the S.D. YLRL received her call, Grace Patton, W6KAP. San Diego's TVI committee now is under the chairmanship of VTS. APG's twin-five for 144 Mc. is working FB. HDN is continuing to work the South Africans regularly. LKB now is mobile on 28 Mc. and QZQ is mobile on 3.8 Mc. in the Santa Ana Area. MLY has left for an indefinite stay in Saudi Arabia. First of the boys in the San Diego Area to pass the Extra Class amateur exam is Jim Chiles, KOL of Chula Vista! DVJ is designing a 2-meter transmitter and ODB is completing construction of a 420-Mc. transmitter. Traffic: (Jan.) W6BAM 836, IZG 176, BSD 65, GTC 54, BSD 30. (Dec.) W6BAM 2171.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, William A. Green, W5BRKH—Asst. SCM, Joe G. Buch, 5CDU. SEC: JQD, RMs: LSN, QHI, PAM: IWQ. Appointments as OO, OBS, and ORS were made to ROH, PZU, and SRQ, respectively. Our SEC, JQD, visited with ECs ARK and LEZ prior to attending a club meeting in Waco. The Caravan Club, under the leadership of ATIM, participated in the alert and organization of a lost plane search in conjunction with the CAP. Also helping were PCC, AAR, MQH, TW, LWZ, and BKH. The Dallas ARC has elected SYT, PCV, and TEA as pres., vice-pres., and secy., respectively, although it is understood they will have to try again on TEA, who has been called to active duty with the Navy. New

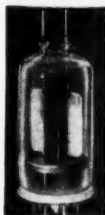
(Continued on page 116)



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officers of the ETARC are QQU, pres., and AJ, secy. We welcome the formation of the NTN (North Texas Novice Net) under the guidance of SQW. This net is primarily a traffic net for the Novice, working on 3735 kc. Mon., Wed., and Fri. at 1630, but all hands are welcome. VIM is keeping skeds with 6FZO when TVI and politics will permit. RYB beat VIM by a little bit for section 88 honors in the phone division. QDF now is operating at KGFAD and handling plenty of traffic. Congratulations to Bonham on another new call, UMX. The SCM enjoyed a visit from QQM. Traffic: W5QHI 263, JOG 120, PAK 104, SQW 95, BKH 94, RRM 72, ARK 68, HBD 56, QMF 53, RJM 50, RHP 48, GZU 41, LEZ 36, TLW 25, ASA 24, AWT 19, CWE 12, SCR 10, SRQ 10, WN5UFP 9, W5QIF 6, BAM 2.

OKLAHOMA—Acting SCM, Jesse M. Langford, W5GVV—SEC: AGM, RM: OQD, PAMs: GZK and ATJ. The Lawton-Fort Sill Radio Club dinner meeting was a big success with lots of gear-swapping taking place, excellent food, and good company. EHC reports some 144-Mc. activity in Oklahoma City with HXL and CXE testing new gear. KBA and KBE have joined the 3995-kc. ragchew group. TKC, TMY, and IEQ are active on 1.9 Mc. GKG gave a talk on converters at ACARC. WN5TKF joined AREC. Mr. Gatlin, the state communications coordinator for e.d., is very pleased with the amateur e.d. showing, but we need more counties represented by ECs. QNK, EC for Blaine, reports the emergency group there was called out to help locate two women and two children who were lost. Mission accomplished. ECL is relieving GZK by sharing some of the overseas traffic. WQ has increased power. OZE took 3rd-class radiotelephone exam and reports he passed. LWG now is in Guymon and operating a new a.m. rig. RST has been appointed Official Bulletin Station. OQD is planning a Novice traffic net to be tied in with OLZ. Bartlesville and Oklahoma City emergency groups are doing great work. ECL is preparing a leaving for a new assignment in Europe; REC has ordered a new Viking. LXG has new 813 clamp-tube-modulated rig on 3.8 Mc. SWJ is taking to traffic like a duck to water. Oklahoma participation in the NTO Net is increasing rapidly. AHT still is in Pawhuska but says it looks like Chicago will be the new QTH. We like it better the way it was. Traffic: W5MRK 508, GZK 414, FOM 128, OQD 101, ROZ 93, MQI 83, FOG 66, MFX 63, GVV 59, JHA 45, SWJ 30, CKQ 14, NVO 14, EHC 10, TKC 2.

SOUTHERN TEXAS—SCM, Dr. Charles Fermaglich, W5FJV—MTG will be operating portable in Wichita during March and April with his Harvey-Wells. Listen for him. OYP is having lots of trouble with TVI and antenna problems. He has moved and expects to put up a 67-ft. vertical. WN5TWB has worked 14 states on 3.5-Mc. c.w. with AT-17 and RME-45. He reports: WN5UMC and UFJ are brothers on 3.5-Mc. c.w. SJA recently got Class A license; he has 420 watts on all bands. RJV also has Class A license. RSW moved to Panama (KZ5SW). QPL is burning up 3.8 Mc. QID's XYL is RTF. TPF now has General Class license. WN5TNP is attending high school. TFF, TPF, and TEG now are General Class licensees. WN5URM is on 3.5-Mc. c.w. with 70 watts. RIIH says 7 Mc. is no good. PY and his XYL visited the SCM in Houston recently. RFG is putting up a double dipole rotary on 14 Mc. FXN reports only one opening on 50 Mc. and that to Arizona and the West Coast. The band was open five hours to XE but nothing but TV was on. He has two corner reflectors on 220. PTV still is making BPL every month. JYM is on 3.5-Mc. c.w. with plans to go to 7-Mc. c.w., code speed permitting. NIY has no TVI because of lack of activity. PM is on 14 and 7 Mc. and participated in the SS, DC and DX Contests, one gallon to p.p. 4-123As. JRZU is waiting for W5 call and running 75 watts cold 807. The Gulf Radio Club (Corpus Christi) now is affiliated with ARRL. AQE took part in the CD Party. RID has been appointed OO. TPR is a new member of the AREC. WN5TOL worked 31 states with Novice 1-tube transmitter and a long-wire antenna. Jerry is 12 years old. Be sure to attend the ARRL Convention to be held the last week end in June in Corpus Christi. Traffic: W5VTV 510, MT 508, TFF 339, PY 339, QFA 156, W4RZU 136, W4QDX 134, RFT 116, RIIH 77, QEM 61, CPG 30, OYP 28, IZB 23, FXN 16, PZS 13, QGU 11, AQE 2, RFG 2.

NEW MEXICO—SCM, Robert W. Freyman, W5NXXE—SEC: PLK, RM: NKG, PAM: BIW. PAM v.h.f.: FAG, New Mexico nets: C.w., 3705 kc., 7:00 p.m., Mon. through Fri. Phone, 3838 kc., 7:30 a.m., Sun.; 6:00 p.m., Tues. and Th. There will be a State ham picnic June 1st in the Manzano Mountains, 17 miles north of Mountainair. Pack up the XYL, kids, food, and your burned-out 807s and come prepared for a good old-fashioned picnic. All New Mexico amateurs and also all out-of-staters are welcome. Our congratulations to PXN on making BPL; he is the first in New Mexico to make it in three years. EJT has a new HBD. A new OM/XYL team in Socorro is RLL and UKZ. RFF and RQK (also OM/XYL) are newcomers to Albuquerque. AK is on 7-Mc. c.w. KWP has four-element 50-Mc. beam aimed for Albuquerque. LAJ has finished all-band VFO exciter and is now working on mobile rig. MYA is reworking the 813s. TBU has 35 watts on 28 Mc. and Command rig on 7 Mc. TVB has an 807 on 7 Mc. A project is underway to obtain amateur handbooks and equipment

(Continued on page 118)

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for the New Mexico Boys Ranch. Contact IH or NXE for further details if you can help out on this. CQ NM, monthly state bulletin, observed its fourth anniversary in February. OYB is interested in contacting others who want to get on teletype. Traffic: W5PKN 562, NXE 56, CA 30, RMH 6.

CANADA

MARITIME DIVISION

MARITIME—SCM, A. M. Crowell, VE1DQ—SEC: FQ, RM: OM, EC: EK. New officers of the HARC are RP, pres.; HD, vice-pres.; WL, secy.; NO, treas.; OM, bulletin editor. With the nation-wide interest Boy Scout and other youth groups are showing in our hobby, all clubs could well provide for junior members and special training classes in code, etc. Heard in the DX Contest were QZ, FQ, PX, QW, and DQ, ZR is a new call on 3.5-Mc. c.w. Recently active on 3.8-Mc. 'phone are SE, AAG, YG, VW/1, NA, AAX, AAZ, AAK, HD, PT, WL, and WD. FARC news follows: BM, OL, and LX are quite active on 3.8-Mc. 'phone. GU seems to do well on 3.5 Mc. in G-Land. JJ was heard keying the oscillator. AO is active on 28 and 3.8 Mc. BI is using the Q5-er to dig up the DX. RF still is the O.T. night owl. Active in the last SS from the N.B. Area were VJ, AAV, AAY, ZK (assisted by CM), GJ, WB, YW, OL, LX, and AM. The emergency c.d. exercise recently held with the Fredericton Fire Dept. caused much favorable comment in proper circles. VE editor of this column greatly appreciates the receipt of several club bulletins. Traffic: (Jan.) VE1YV 299, FQ 184, MK 160, OM 59, DQ 43, AAK 34, PZ 32, ZO 29, AL 26, ABJ 22, HT 19, DB 15, AA 14, TO 12, JA 7, XA 7, ZM 6, AB 5, FR 4, ZE 4, XH 2. (Dec.) VE1DB 3.

ONTARIO DIVISION

ONTARIO—SCM, G. Eric Farquhar, VE3IA—It is with a heavy heart we record the passing away of two highly-esteemed Ontario section amateurs: AKL and NI. Carl G. Heilig, AKL, who became one of us in 1949, did yeoman work during the land hurricane of Nov. '60, for which he was awarded a Public Service certificate by ARRL. He was a member of the Hamilton ARC, James A. MacArthur, NI, Phone Activities Manager, received his ticket more than thirty years ago, to become the first licensed amateur in St. Thomas. Jim was commended on several occasions for carrying out missions of mercy via ham radio. His station was an integral part of the civil defense organization in his district. He was given high tribute by the Ontario Phone Club, of which he was a charter member, when some 32 stations assembled and conducted a memorial service. The Queen City Club put on a fine demonstration of initiation into the "Mystic Knights of the Ether" recently. Mr. G. Whitman spoke on the atom bomb at a well-attended Quinte Radio Club meeting. Belleville Emergency Corps holds drills on 7250 kc. ARZ reports his call as being bootlegged on 7 Mc. The Frontier Radio Club enjoyed the film "A Voice Shall be Heard." Welcome to ham radio, DFE. Now located in Hamilton is BDH. Regular reporters into OSN are ATR, BBM, BIU, BL, BMG, BNC, BOZ, BPU, BUR, DGA, DU, EAM, GI, OD, SF, SG, and TM. VR moved to Ancaster. AKC and AES are heard on 144 Mc. ARRL appointments and endorsements are: BPE and DGZ as ECs; BPE and SG as ORS; AHA as OBS; BTE as OPS; BPB as OES. With my two-year term drawing to a close, I wish to offer myself for nomination again. Traffic: (Jan.) VE3ATR 203, BUR 173, IA 88, TX 78, IL 77, BWY 70, WY 70, BER 63, BJV 42, AYW 39, EAM 24, DU 22, PH 22, AZH 14, BL 11, VD 8, EAU 7, OJ 4, AUU 3, SG 2, VJ 2. (Dec.) VE3TX 106, WE 16, TO 15.

QUEBEC DIVISION

QUEBEC—SCM, Gordon A. Lynn, VE2GL—SA has found it necessary to resign from the post of SEC because of increased commitments elsewhere, and the appointment of BR has been made to this important post. KG is back on 28 Mc. from his new QTH, has renewed OBS appointment, and has been appointed as president of the South Shore EC, now at Trois Rivières, skeds local net, Trois Rivières, Shawinigan Falls, Grand Mere, and Cap de la Madeleine on 144 Mc. The annual banquet of the St. Maurice Valley Radio Assn. was held Feb. 3rd with 32 members in attendance. ABD, APS, ARX, and AFM are newcomers in that region. The Montreal Amateur Radio Club held an election of officers with ADX as president. ADX is a newcomer in Sherbrooke and was visited by AO recently. AAO has completed new frequency meter. LO had the misfortune to fall and injure his right wrist badly, putting him off the air for about ten days, but he now is O.K. TA made the BPL in December, the first in this section for many moons. CK has 'phone patch and makes many of the Far North boys happy. CA reports Phyl still is busy with traffic to the North. KZ has converted to n.f.m. on 14 Mc. AKJ reports into PQN regularly, DI is on 14-Mc. 'phone now after many years of c.w. Traffic:

(Continued on page 120)



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HAND CARRY

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HT-22 (150-174 Mc.)
*On 25-50 Mc.
One watt output
on 150-174 Mc.



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(Jan.) VE2TA 210, CD 90, CA 63, GL 42, XR 35, AMB 22, CK 22, AKJ 12, LO 12, EC 7. (Dec.) VE2TA 520.

VANALTA DIVISION

ALBERTA — SCM, Sydney T. Jones, VE6MJ — HL, one of the old-timers in the ham game, reports he is back on the bands again using a 6L6 for a start with a higher-power final being planned. QC says the poor band conditions have not hampered the operation of the Peace River Net. HM received the news of the arrival of a new grandson via amateur radio but in the most round-about way — via VE1FQ, VE8SQ, W8CAB and VE8MC. DZ took part in the recent Frequency Measuring Test. GW is new call in Edmonton, as is FP. EO plans to join the AFRS Net. EH has made further improvement in his mobile antenna for 14 Mc. WS is QRL building a new ham shack in the basement. IW secured a position with an oil company. VK has returned to the air with a nice signal and is assisting CE in a rebuilding job. The suggestion has been made, in view of recent poor band conditions, that the Alberta Net have an alternate c.w. frequency in the 7-Mc. band which could be used when 14705 is NG. Your comment should be forwarded to our Phone Activities Manager, O.D. Traffic: VE6HM 70, EO 8, MJ 7.

BRITISH COLUMBIA — SCM, Wilf Moorhouse, VE7US — The Province is divided into 14 areas now and there is an EC for each district. QC is Net Manager of the AREC Net. Civil defense and police were made officially acquainted with AREC in Victoria. AC is doing well with 8 watts c.w. AQB is on 7 Mc. SH has a new receiver. AHF finds TBS NG. AFJ is mobile. DH is very active in AREC. ALL visits DH and LP/7. PP was heard from. AMJ is active. BCARA meetings are held as usual with FB new president. DD is busy with AREC activity. US is building a new rig in a new cabinet. ASA has contacts on 7 Mc. with 20 watts. EG has a new VE1 operator, VE7T. The 5-p.m. Net is operating as usual on 3797 kc. The SCMs of Alberta and Washington are requested to supply c.d. stations with B. C. QC plans a trip to Chilliwack to see some of the gang. 28 Mc. opened up for a few days last month but 3.8 and 7 Mc. was spotty after 8 p.m. US tours AREC members on Vancouver Island. QC is doing excellent work in the AREC group. Will more ARRL members send in a note of interest? AOB is 250 watts at last! A report was received from TT; SS is on after 13 years absence; ZM is dusting off BC-610; QX is on receiver job; ACC is checking nets; AIW and JG are getting ready for Class A. Traffic: VE7QC 71, DH 31, AOB 11, AMJ 8.

PRAIRIE DIVISION

MANITOBA — SCM, A. W. Morley, VE4AM. New officers of WARC are SR, pres.; EL, vice-pres.; DP, secy.; and Dave Gilmour, treas. Congrats to JG (ex-3AKN) on the addition of a jr. operator. RO has new colinear beam for 3.5 Mc. EV is interested in 50 Mc. and inquires about OES. 6AO was in the Peg on a visit. RG, at Roston, is on 75-meter 'phone with 807s. Ex-FN now is signing EL. WT plans new all-band rig with 829 final. TM, at Selkirk, is ex-1TN. MX, at Waskada, is on 75-meter 'phone with Globetrotter. IR and HL received RCC certificates. JD has new 75A-2 receiver. NI is on 75-meter 'phone when the jr. operator isn't busy with sked on 14 Mc. with 3PZ. DT, at Myrtle, is using a terminated folded dipole on all bands and is heard in VE1-Land on 75-meter 'phone. HG has new VFO going on 80 meters. NCS on the 'phone net is being rotated to give all experience. Report via the net if you desire, but don't forget it. Traffic: VE4HG 73, DJ 38, HV 20, CE 11, HL 11, ER 4.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — North Battleford has three new calls: AG, formerly VE2AMG, at the Radio Range; MK, formerly a VE3 with the RCMP; and NX, a new ham with CJBX. DX, of Shellbrook, is an old-timer back for another fling. WL is a new ham at Buffalo Narrows. NC is in Saskatoon for a few months and will be missed by the v.h.f. gang. CJ is heard on 75-meter 'phone. VESMC is looking for VE5 QSOs. MQ, his XYL, and DN attended the Saskatoon Club's annual party, MQ bringing a TZ-40 back as a prize. DZ, XYL of GW, is a new amateur and swings a nice fist. Congratulations. Ebba. WJ has moved to Clyde, Alberta, and will be a VE6 soon. DR converted his phone rig to Class B and puts out an FB signal. JU is a new ham heard on 3.5-Mc. c.w. from Saskatoon. KO has a new Commander receiver and AS has a 75A-2 receiver. LD is increasing power to 100 watts. PJ reports into the North Dakota Net nightly and will QSP any time. BZ is taking a try at 40 c.w. and 20 'phone. Traffic: VE5BV 55, TE 45, HR 26, PJ 7.

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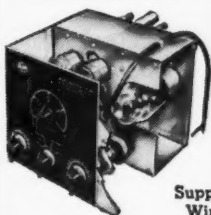
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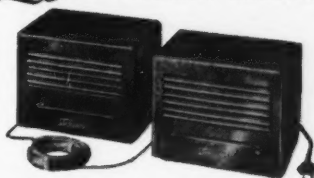
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HT-22 (150-174 Mc.)
*At 25-50 Mc.
One-watt output
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LETTINE RADIO MFG. CO.

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The "Bandbox"

(Continued from page 16)

adjust C_{16} to increase the peak. The correct adjustment is the one where no readjustment of either the gang or the trimmer will increase the drive. Now turn the oscillator to 3750 kc. and retune the multiplier. The drive to the amplifier should be essentially unchanged.

Now tune the oscillator back to 3500 kc. and retune the multiplier for maximum output. Leave the multiplier and oscillator tuning at this point and turn the bandswitch to 14 Mc. Adjust first C_{24} , and then C_{19} , for maximum amplifier grid current. It may take a little juggling back and forth between these two before a maximum reading of drive is obtained. The milliammeter in the high-voltage lead should show a dip when C_{24} is tuned through resonance.

Leaving all tuning adjustments fixed, turn the switch to the 21-Mc. position. Now adjust C_{24} carefully and note whether an increase or decrease in capacitance causes an increase in drive to the amplifier. If it is an increase, lengthen the tap wire (see preceding section on coils) slightly. Then turn the switch back to 14 Mc. and readjust C_{24} for maximum drive. Then switch back to 21 Mc. and check carefully again. By adjusting the length of the tap wire carefully, it should be possible to arrive at a condition where maximum drive is obtained both at 14 and 21 Mc. with the same adjustment of C_{24} . Remember, after each adjustment of the tap length, first go back to 14 Mc. and retune, then switch to 21 Mc.

TABLE I
Typical Voltage Readings* (Supply Voltage 380)

Stage	80			40			20/15			10		
Switch Position	Cath-ode	Grid Leak	Screen	Cath-ode	Grid Leak	Screen	Cath-ode	Grid Leak	Screen	Cath-ode	Grid Leak	Screen
80	65	25	235	17	0	19	0	16	0			
40	60	30	221	40	97	19	0	16	0			
20	59	30	211	36	96	72	126	16	0			
15	58	31	207	34	89	93	106	16	0			
10	58	30	207	34	89	69	120	45	130			

* By dividing these voltages by the associated resistance values, any desired current value may be easily calculated.

Adjustment for 28 Mc. is similar to that for 14 Mc., although it will be more critical. Careful adjustment of C_{28} and C_{35} will be necessary for maximum amplifier drive. The 11-meter band is covered by tuning the multiplier to resonance at the desired frequency with the switch in the 28-Mc. position. The various circuits should be checked with an absorption wavemeter to make sure that they are tuning to the right multiple.

When the above adjustments for the low-frequency ends of the various bands have been completed as described, it should be found that the output will be essentially the same at any

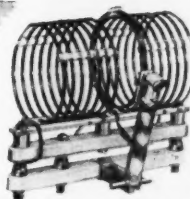
(Continued on page 124)

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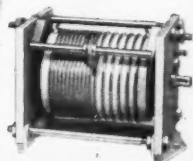


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95w. 25-50 Mc.
One watt output on 150-174 Mc.



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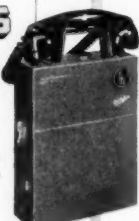
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point within a given band. There should be no difficulty with this so long as the coils and condensers have the values specified. Although such accuracy in lining up isn't necessary, it should also be possible to resonate the multiplier for maximum drive at 7000 kc. and then, without retuning, switch to 14 and 28 Mc. and find that these stages are delivering maximum drive.

TABLE II
Typical Total Current and Output Readings*

	80	40	20	15	10
Amplifier bias ** (volts)	152	195	187	144	140
Total B ma. at resonance	41	47	53	60	60
Total B ma. off resonance	45	58	75	78	85
Total B ma., no excitation — 35					

* Average supply voltage 380.

** Voltage measured across 39,000-ohm grid leak of unloaded 6146 amplifier.

If the circuits haven't been lined up accurately, slight retuning of the multiplier control may result in somewhat increased output. As mentioned previously, with the switch in the 80-meter position, the tuning range is different, so that it will always be necessary to retune for this band.

The accompanying tables show typical voltage readings taken with the unit in operation driving the grid of a 6146 amplifier. The unit was also checked driving a loaded 807 on all bands at maximum 'phone ratings. Rated grid current or more was obtained on each band. The unit was allowed to run continuously at 28 Mc. for an hour to make sure that nothing overheated or drifted. Checks were made at 28,000 kc. with a resistor load connected externally across the multiplier output. With a fringe-area picture on a TV receiver within a few feet of the unit there was no detectable interference. Of course, you'll still have to work on the rest of the rig, but you can be reasonably sure that if you get TVI, it won't be coming from the multiplier unit.

Elevator Mast

(Continued from page 25)

tower, so that the sections of rail can be butted together inside of a tie.

The hoisting detail is apparent from Fig. 1A, and you may want to be fancy and use an electric hoist. The winch we used was a Navy surplus item that is still available, and it is no real hardship to raise the carriage. It only takes about 10 minutes to unhook the four guy wires and lower the carriage, and it takes about the same time to raise the carriage and replace the guy wires.

We like to try antennas for 10 and 20 meters, and several different ones have been used already, now that they are so easy to work on. Since the pictures were taken, the boom has been extended to 30 feet. A 20-meter beam is presently fed with 52-ohm coax, which is buried under the ground along with the rotator and indicator cables for a distance of 100 feet to the shack.

Novice-Technician V.H.F. Transmitter

(Continued from page 29)

the rest of the coil to reduce the inductance. The third-harmonic dip should come as close to the minimum setting of C_2 as possible.

An output indicator can be made by soldering a loop of insulated wire about the diameter of the coils across the terminals of a pilot lamp. The bulb can be a 2-volt 60-ma. type (pink bead) for a sensitive resonance indicator, or a 6.3-volt 250-ma. (blue bead) type for stages where there is more power. The former, if coupled loosely to any of the tuned circuits, will not detune the stage appreciably. It may burn out, however, if coupled tightly to either of the next two stages while they are operating at full input.

Next connect a jumper from Pin 4 to Pin 2 in P_1 , and the meter between Pin 5 and Pin 2 to check the combined plate and screen current in the 5763 doubler stage. Couple the lamp to L_4 and tune C_3 for maximum brilliance indication. If two meters are available, one can be connected between Pins 10 and 11 to read grid current in the final stage. This is the best tuning indication for adjustment of the doubler, and provision should be made for leaving a meter connected permanently in this circuit if at all possible. Now C_5 should be adjusted for maximum output from the stage as indicated by the brilliance of the bulb or the grid current in the final stage. Start with C_5 at the minimum setting and turn it down slowly, readjusting C_3 for maximum output intermittently. These two adjustments interlock, but a point will be found beyond which further increases in the capacitance of C_5 will cause a reduction in output. The grid current at the best setting will be 10 ma. or more; the more the better.

Adjustment of the final stage is similar to the above. In these 5763 stages there may not be appreciable dips in plate and screen currents, so the grid current in the final stage and the output as indicated by lamp load are the most reliable indications of proper tuning. The load for the final stage can be a 10- or 15-watt lamp bulb connected across L_6 , when the stage is operated on 145 Mc. The blue-bead pilot lamp, or two of them connected in parallel, will serve for 220-Mc. use.

Adjust the position of L_4 with respect to L_5 for maximum output as indicated in the lamp. For the 2-meter coils this will be with the two inductances approximately half meshed, as shown in the bottom-view photograph. For 220 Mc. the two U-shaped loops will be parallel to each other and perhaps a quarter inch apart. If voice operation is to be employed, try talking or whistling into the microphone. The lamp load should brighten perceptibly under modulation. If it does not, or if it dips in brightness, it is probably due to insufficient grid drive to the final, or to excessive coupling to the final plate circuit, or both. Try reducing the coupling slightly, and

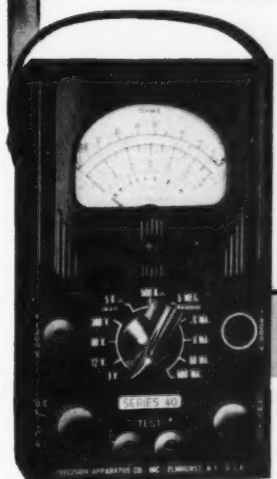
(Continued on page 126)

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recheck all tuning adjustments for maximum final grid current. Operating conditions with 300-volt plate supply should be approximately as follows:

Oscillator plate current — 12 ma.

Multiplier plate current — 17 ma.

First 5763 plate and screen current — 40 ma.

Final grid current — 10 ma.

Final plate and screen current — 100 to 120 ma.

Output, 145 Mc. — 12 watts; 220 Mc. — 3 to 4 watts

The modulator to be employed can be almost any tube line-up that can supply 15 watts or so of audio power. A suitable design was described in detail in *QST* for April, 1950,² and there are other models in all recent editions of *The Radio Amateur's Handbook*. If a good heavy-duty power supply is available it can be used for the entire transmitter, in which case it would be connected as shown in the article referred to above.³ A better method would be to use separate supplies on the modulator and transmitter, with the connection shown in Fig. 2. Either way, the plate and screen current of the final flows through the secondary of the modulation transformer.

We are now ready to do some transmitting. Connect the antenna to L_4 by plugging it into the crystal socket that serves as the output terminal, starting with the coupling in the position that worked best with the lamp load. By means of a field-strength meter, or with the aid of an amateur who has a receiver with an S-meter, adjust the coupling to the point that gives the strongest signal indication, and you're on your way.

²Tilton, "A 2-Meter Station for the Novice," April, 1950, *QST*, p. 42.

Strays

Certificate of Superlative Achievement

BE IT KNOWN BY ALL WHO CAST EYES UPON THIS SUPERNATURAL DOCUMENT, that HAVING HAUNTED THE SANGUINUM OF THE TEN METER BAND FOR AT LEAST ONE HOUR PAST THE STROKE OF MIDNIGHT WITH _____ IS RECOGNIZED AS A FULL FLEDGED SPOOK, AND MEMBER OF THE GHOST TO GHOST NET WORK, HAVING THE AUTHORITY TO RATTLE HIS GHOST WATTS UPON THE GHOSTLY KILOCYCLES AS AN OFFICIAL SPOOK. HE MAY RECRUIT BEINGS OF THE NATURAL WORLD TO BECOME MEMBERS OF OUR ELATED NETWORK. MAY HIS LOG BE FILLED WITH MANY HAPPY HOURS OF HAUNTING . . .

PHASE OF CHIEF SPOOK

Ten-meter amateurs in the vicinity of Washington, D. C., have gone to some length to augment their late-hour "supernatural shenanigans." W3MO, W3NOI, W3PWB and W3QNY originated a "Ghost-to-Ghost" network which has been going strong since September of last year. Over 35 members are on the roster.

To become a full-fledged "Spook" a prospective member must find himself a network member between the hours of midnight and sunrise and haunt the band with him for at least one hour. He may then be awarded the above certificate of supernatural achievement. His XYL automatically becomes a "Witch"; if he should later fall asleep during a wee-hours QSO he becomes the lowest order of "Spook" — a "Zombie"! — Katherine Smith

Single Sideband

(Continued from page 40)

signals they are trying to copy. It sounds like a loud "hiss" or rushing noise on the band, and sometimes it is confused with rectifier hash from a power supply. It results, of course, from one or more high-level stages drawing plate current and acting as large diode noise generators, or amplifiers of noise generated at a lower level. The voice-control gang lick it by "keying" several stages, the voice-control circuit operating keyer tubes or relays. Al Hyde, **W1GR**, uses a 304TTL in the final and increases the bias to far beyond cut-off during listening periods with one of those small 24-volt relays out of a 274N transmitter. The voice-control circuit operates this relay and the others, and the present complete elimination of the noise from the transmitter lets Al dig down deep for the weak ones.

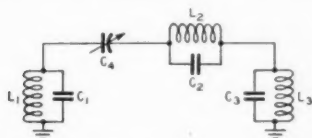


Fig. 3 — This circuit, or something similar, is one that you may run into in your s.s.b. work, although it is usually shown with C_4 jumped. L_1C_1 and L_3C_3 are tuned to the desired sideband, and L_2C_2 is tuned to a frequency to be rejected (usually a local-oscillator frequency). Dick Long, **W3ASW**, advises you to be sure to include C_4 and to make it adjustable.

Although you get the impression through listening that voice control is the only thing, you can still get plenty of argument from fellows like Al Prescott, **W8DLD**, for example. He has voice control working fine, but he still thinks you can't beat a foot-pedal break switch for the transmitter and a single 6H6 to control the receiver, particularly for all-around 'phone and c.w. operation. Al has used the foot switch for years and says that it took voice control to convince him that the foot switch is good. The one relay in the system (in the antenna) does take a beating, Al says, but there are no others, and you should use the same antenna for transmitting and receiving anyway.

And if you're looking for a way to eliminate the antenna relay in your fast change-over system (foot-switch or voice-controlled), don't overlook the neat stunt used at **W6YX** and shown on page 14 of last month's *QST*. It should be a natural for s.s.b. net operation. — *B. G.*

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Portable 2-Meter Station

(Continued from page 47)

quarters. Reliable car-to-car communication is generally limited to distances of a mile or two, depending on terrain.

Under favorable conditions, much greater distances are realized, and various units have reached out as much as 50 to 100 miles from good locations. Many of the club members, in fact, are using these rigs for their home stations and have made a.c. supplies for them.

In conclusion, the writers wish to emphasize again the important contributions to the success of this project effected through the pooling of the abilities of the members of the club. In addition to those already mentioned, participants included W2s AXJ COT ICA IJS JGP NCF NRQ RKB WAA, WN2IHD, and nonlicensed members George Endres and Tom Harmon.

C. W. Net Operation

(Continued from page 49)

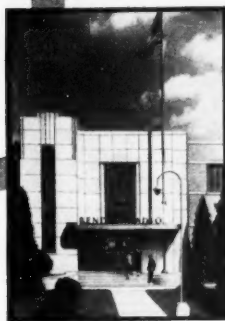
Most nets permit the exchange of personal greetings to a greater extent than shown in the above example. However, you should limit or omit the use of such greetings until you see how busy the net will be.

Be alert for instructions from the NCS and respond promptly to them. When you have been instructed by the NCS to send your message, proceed at once; but don't try to be a speed king. Remember accuracy is paramount. The loss of time necessary to make a correction, or to provide a "fill" is always greater than the time saved by high-speed sending.

Do not send the message double unless requested to do so by the receiving station. If a repeat is necessary, the other fellow will break you and ask for it right then and there. Use AA at the end of each line of the address. Use BT only at the beginning and end of the text. When you come to a single letter in the text send IMI and repeat the letter. This will keep it from getting lost or being hooked on to another word. You should also send IMI and repeat any word or group of letters where confusion might result. If you make a mistake, send a string of dots and start the word over. When you get to the end of your message send AR B if you have another message for the same station and wait for the receiving station to acknowledge your first message. If you have no other messages for him, send AR N and wait. When the receiving station has acknowledged your traffic and indicates that he has nothing for you, you should then say QRU TU SK W—— DE W—— and report back to the NCS on the net frequency for further instructions. However, if you have been working on the net frequency, no further signals are necessary and the NCS will carry on.

Messages received for relaying must be forwarded either by radio or by mail within 48 hours.

(Continued on page 130)



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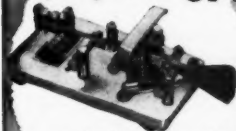
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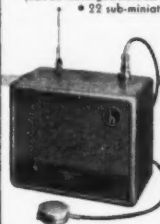
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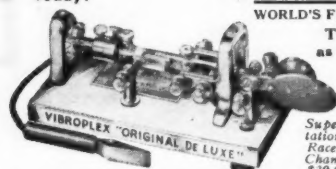
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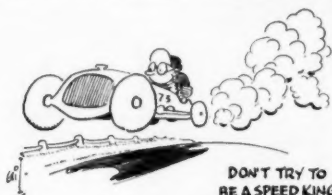
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S. E. T.

(Continued from page 52)

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(Continued on page 152)

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A new Hallicrafters product—the "Littlefone"—is now ready for thousands of important uses in hundreds of industries.

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- Weighs only 14 pounds!
- Complete, self-contained 2-way radio-telephone station!
- Rugged, weatherproof
- Powered by Dry, or Wet Rechargeable Batteries (can be recharged from car battery or 117 Volts AC)
- 22 sub-miniature tubes on dual super heterodyne and phase modulated transmitter.



HAND CARRY

HT-21 (25-50 Mc.)
HT-22 (150-174 Mc.)
*On 25-50 Mc.
One watt output
on 150-174 Mc.



CENTRAL STATION

HT-23 (25-50 Mc.) HT-24 (150-174 Mc.)
Same performance and specifications as the "Littlefone" Hand Carry.

- AC-operated Central Station
- Audio-amplifier, providing one watt of audio for loudspeaker
- Power consumption is 35 watts
- Plugs in any AC outlet (117 Volts)

Where extra stationary receiving stations are desired, Hallicrafters economical S-81 and S-82 receivers may be added.

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W. H. Edwards Co.

94 Broadway, Providence 3, R. I.

pleasure in executing their responsibility as a part of the Amateur Service), some recompense may be felt in the knowledge that as the most direct public service, emergency preparedness is a great contributor to retention of our precious amateur privileges, including the valuable frequency space we occupy.

And so we ask: Were you there? Although 2750 amateurs is the highest number we have ever recorded as participating in the SET, this is still a far call from the some 20,000 who are registered in the AREC. If you did not participate in the SET in 1951, make a mental note of the month of October as a "must" for 1952. Get after your EC, or if there is none, take steps to see that one is appointed for your area by the SCM—yes, even if it has to be you!

Comments

Some of the comments concerning the SET activity in 1951, taken at random from the stack of 214 reports, include the following:

"It seems that 65% of our AREC boys think it can't happen here."—W4SOD, EC Dillon County, South Carolina

"I received splendid cooperation from the Disaster Service of ARC and from CD officials during the SET."—W4EJC, EC Fulton and DeKalb Counties, Georgia

"Civil defense plans have come a long way in the past six months locally."—W1ADW, EC Danbury, Connecticut

"The publicity caused local CD officials to seek us out. Our work was very highly praised."—W2VKF, EC Staten Island, New York

"The participating members showed excellent cooperation, but the test indicates that there is considerable dead wood in my organization."—W4EHC, EC Oklahoma County, Oklahoma

"We claim record as having greatest number of points for cities under 5000 population."—W7HJ, EC, Boulder City, Nevada

"Keep the ball rolling. We are in this thing too deep to back out now."—W9SXJ, EC Area G, Cook County, Illinois

"Quite enlightening!"—W6FIP, EC Southern Stanislaus and Northern Merced Counties, California



"It's only thirty-seven feet
Up here above the ground,
And only sissies wear a belt. . . .
Bow heads for Tim McClown"

Happenings

(Continued from page 32)

to straight renewals only; if a modification or other change is sought, continue to use old Form 610. Editorial changes in our regulations are being made to accord with the new procedure.

Proof of operating time as a condition to renewal is still required; the applicant by his signature affirms a statement on the form that he has complied with the minimum renewal requirements.

Strays

Those amateurs tiring of TVI might take a whack at GDI — garage-door interference. W9GJY reports a local garage door that really went berserk every time some local hams switched on their rigs. Radio-controlled, the installation was accidentally tuned to 14 Mc.

An up-to-the-minute check reveals that five Novices now have qualified for WAS certificates. We should say *ex*-Novices — the boys are already full-fledged General Class licensees. It's difficult to say just who was the first because Ken Lamkin, W6NDP, and James Cromwell, W5TFD, had their applications reach ARRL Hq. in the same mail. The third went to Phil Battey, W4TFX, whose dad, Ev Battey, W4IA, was assistant communications manager of the League for many years. The fourth and fifth candidates are William Brown, W4TED, and Ray Thacker, W5TFP, respectively. What comes next, fellows — DXCC?

Quist Quiz

A ham has added a modulator to his 80-meter c.w. rig so that he can operate 75-meter 'phone. The c.w. rig gave him trouble with low-frequency parasites, but he finally cleaned it up by a judicious selection of plate and grid r.f. chokes in the final stage. Now on 'phone he gets similar parasitic oscillations, which show up as weak modulated carriers at 15-ke. intervals either side of the carrier frequency. Is he in for another choke-selecting session, or should he try something else first?

(Please turn to page 134 for the answer)

Niagara WANTS HAMS TO SELL HAMS...

Niagara needs hams to work as counter salesmen. Full time — steady work — good pay. Component stock knowledge preferable but not necessary.

Send resume and salary desired to M. Santer

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OR FIXED OPERATION, NOVICE OR EXPERT
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A complete ready-to-go phone transmitter including new crystal-oscillator — vfo switching circuit — Phone or CW — 100% break-in operation — Eight bands: 80, 40, 20, 15, 11, 10, 6 and 2 meters — No plug-in coils — completely wired and tested. Tubes: 6AQ5 Crystal Osc., 6AQ5 Buffer Mult., 007 Final, \$111.50
2-6L6 class B Modulators. Sturdy Steel Cabinet 12" x 8" x 8".

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- Rugged, weatherproof
- Powered by Dry, or Wet Rechargeable Batteries (can be recharged from car battery or 117 Volts AC)
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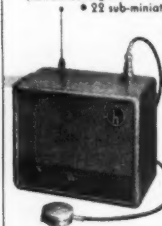
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CRABTREE'S WHOLESALE RADIO & TELEVISION CO.

2608 Ross Ave., Dallas 1, Texas

YL News and Views

(Continued from page 55)

recently added a BERTA certificate to her ever-growing collection. WIMCW covets one of these prized certificates, too. . . . Hawaiian YLs have founded their own club. Twelve attended the first meeting. . . . WN6CQV, WN6PJU, W6KER, W6KYZ, and W6LBO are new W6 YLRL members. . . . G3HSQ is a new YL in England. Jean was formerly V81YL and the first YL in V81-land. . . . W4UTO gets a chance to operate forty and eighty only when her OM, W4OMW, and son, WN4UNH, retire from the shack. . . . A Hammond organ vies with amateur radio for W2QBJ's attention, but Hazel confesses that if ten really opens up, the decision would be obvious. . . . KH6OI now signs portable KL7. Flo recently moved from Hawaii to Anchorage, Alaska. . . . VE3BFJ enjoys work as a radio operator at the Forestry Department in Geraldton, Ont. Jean is a polio victim whose enthusiasm and independence have inspired others. . . . W8TH recently became the bride of W4NQP. . . . After six years in Hawaii, KH6TI anticipates a journey to her Maine home in August. . . . The Washington (D. C.) Radio Club sponsored a Valentine dinner at the Hotel 2400 for all amateurs in the area. W3MSO, president, and W3CDQ, W3LSX, W3AKB, W3OQF, and W4LKM were YLs who attended. . . . W8BFQ, a v.h.f. enthusiast, is finishing work on new gear for 50, 220, and 420 Mc. And on ten Margaret worked Angola for her 120th country. . . . W4SGD, W8FYT, and KH6AFN are now Advanced Class. . . . Twenty-four YLs attended the Los Angeles and San Diego YLRC's joint luncheon. The L. A. girls voted unanimously to go out as a club on Field Day. . . . At 14, Barbara Jordan is the youngest YL in the British Isles to have passed the G.P.O. code test. Barbara is a fully-qualified operator of G3FYN, and she also operates G2ATM under supervision. In May she plans to take the R.A. examination. Presently she is giving code instruction to girls younger than herself, and who, along with Barbara, are members of the World Friendship Society of Radio Amateurs.

New YL Certificate

The Young Ladies Radio Club of Los Angeles announces that a Lad 'n Lassie Certificate will be awarded to any ham who submits proof of QSOs on the air with twenty of the Club's active members—one member per QSO. All contacts must have been made since January 1, 1952. Confirmations should be sent to the Club secretary, Mary Klein, W6AVF, 502 N. Gladys Avenue, Monterey Park, Calif. Current active members of the YLRC of L. A. are W6- AVF CEE EHA GAI JMC JMS KER KYZ LBO LNP NAZ NLM NZP TDL UHA VWR WQK WRT WSV YZU, WN6- CQV PJU, VE3QL, and Joan Dolman, who awaits a ticket.

Miscellany

YLs in the New England and Chicago areas are referred to the Hamfest Calendar section of this QST (p. 10) for particulars on two coming YL get-togethers.

Even if you are not particularly interested in WAS/YL, there are many who are. Let's dispel claims that YLs are sometimes a bit slow to QSL. Send along your card promptly!

W5MJU suggests that YLs who plan to journey into other districts might make their plans known to YLRL District Chairmen considerably in advance, if possible. In that way, perhaps fewer opportunities will be missed, and more YLs will get to meet each other in person.

Answer to QUIST QUIZ on page 133

uncommon.
modulator could be the trouble, and it is not
oscillation in the speech amplifier or in a Class B
is the modulator and speech amplifier. A 15-kc.
but not c.w. operation, the logical point of attack
Since the spurious signal is there during phone

World Above

(Continued from page 61)

oscillators and simple receivers. George is planning on crystal control and a converter, however.

W9TQ, Milwaukee, is stirring up interest in 2-meter teletype operation. He maintains regular noontime skeds on 2, and a growing list of stations cooperate in promoting daytime activity. W9JBF, Wausau, Wis., would like information on where to get a machine in order to work with W9TQ and W9DDG.

W9LEE, Westboro, continues his 0745 and 2100 skeds daily with W0BBN, Grand Marais, Minn. The signal is always audible over this 160-mile hop, and has been readable about 75 per cent of the time under winter conditions. The night of Feb. 2nd brought good tropospheric conditions and W9LEE made his first Indiana contact on 2, with W9LEF, Valparaiso, 320 miles. Not bad for winter!

W9MBI, Coleta, Ill., has a 430-Mc. crystal-controlled converter with some interesting ideas that make for simple circuitry and a minimum of birdie trouble. A crystal oscillator on 63 Mc. serves two purposes. Used in half a 6J6 section it provides excitation for another 6J6 which doubles and triples to 378 Mc. It also feeds the other half of the 6J6 which operates as a second mixer on 52 to 58 Mc. The output of the second mixer works into an i.f. system that is

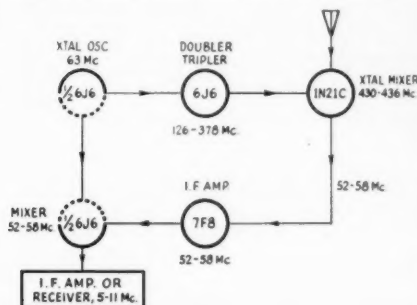


Fig. 1 — The W9MBI 430-Mc. converter.

tunable from 5 to 11 Mc. The 430- to 436-Mc. mixer uses a 1N21C crystal in a coaxial-line assembly salvaged from an R89 glide path receiver. A similar coaxial assembly furnishes the 378-Mc. tank circuit for the output of the injection chain. Following the crystal mixer is a 7F8 i.f. amplifier, soon to be replaced by a 6BQ7. Thus, with only three tubes, Clare has a stable and sensitive low-noise converter for 430 to 436 Mc. The 63-Mc. crystal was obtained from the James Knights Company. A block diagram of the converter is shown in Fig. 1.

Want to help a British 420-Mc. enthusiast in distress? A London experimenter writes of his work with converters on 420, saying that he has gotten a crystal-mixer job going with a crystal-controlled injection source. Now he wants to put a lighthouse r.f. stage ahead of the crystal mixer, and has built a coaxial line job for that purpose. His problem is that no more 446s or 2C40s seem to be available in Great Britain, so he would like to swap one for a subscription to a British magazine, or some other commodity of like value that is purchasable over there. (The dollar problem prevents purchases from this country). Anyone interested in helping out, write to Sven F. Weber, 65 Combemartin Road, Southfields, London S. W. 18.

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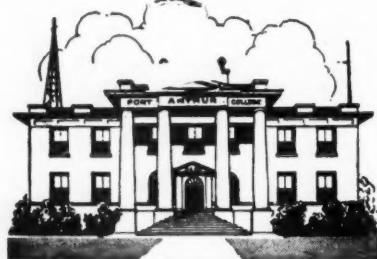
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PORT ARTHUR COLLEGE PORT ARTHUR
TEXAS
Approved for G. I. training

How's DX?

(Continued from page 65)

23 watts to an 807-807 rig. A long-wire antenna is preferred and the receiver is a British BRT-400. . . . After 38 months in the Far East, JA2GA is returning to the U.S.A. and W6KNF. This will make JA2CL the long-beard of the FEARL gang; he and JA2GA fired up a rig together in '48. . . . FQ8AB and VR5GA are now closed down. W9TRD learns the former is back in France and the latter in ZL. . . . PA0BWH (W2BWH) is the first American to be licensed in the Netherlands according to DL4LQ. He is with Philco. A new class of PA0 license is now available and is similar to the U.S. Advanced Class. Its privileges include a permitted input of 150 watts. . . . W1RWS finds that G2MI came through a major hospitalization and operation with flying colors. Just in time to distribute over a thousand GD3UB QSLs! We could use one, too. . . . The QSL, we mean! . . . ZS2AG has been unable to pry cards from Idaho W7s and desires a schedule for WAS with one who likes to QSL. ZS2AG firmly believes in a 100-per-cent QSL policy. . . . Notes from the West Gulf Division DX Bulletin of W5KUC/UCQ: A ZS may go to ZD7 in a month or so for a six-week sojourn. . . . VR4AE and ZC2AA are two nifties rumored to be active. . . . MP4KAD is ex-VT1AB. . . . FB8ZZ is shy a modulator and expects to remain on Amsterdam for another year. . . . ZD9AA has been constructing a 20-watt 'phone-c-w. ex-haler with which he hopes to clean up on W6s. He is a radioman for the meteorological station on Tristan da Cunha and likes 14 Mc. . . . AP5B is back in India; W4TO is the man to write for tardy QSLs. . . . F7YB has been off the air while battling bugs in his receiver.

Jeeves discloses his latest invention, a left-handed receiver tuning dial. Conditions being what they are, this will enable one to tune with the left hand while holding one's nose with the right.

A.R.R.L. QSL BUREAU

(For a list of overseas bureaus, see p. 57, Dec. '51 QST.)

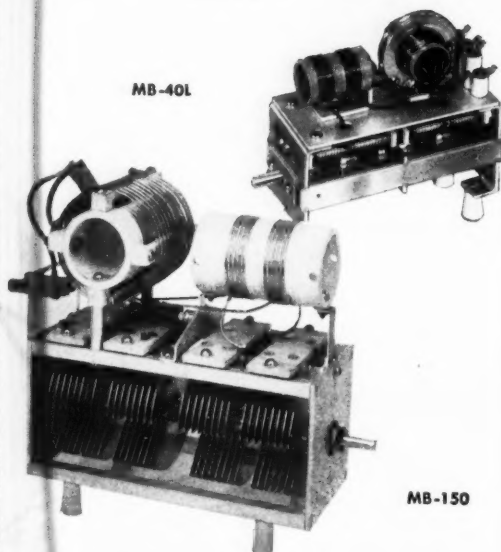
- W1. K1 — J. R. Baker, jr., W1JOJ, Box 232, Ipswich, Mass.
- W2. K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
- W3. K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.
- W4. K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
- W5. K5 — L. W. May, jr., W5AJG, 9428 Hobart St., Dallas 18, Texas
- W6. K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
- W7. K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.
- W8. K8 — Norman W. Aiken, W8LJS, 701 East 240th St., Euclid 23, Ohio.
- W9. K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.
- W0. K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.
- VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
- VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.
- VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.
- VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
- VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
- VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
- VE7 — H. R. Hough, VE7HR, 1330 Mitchell St., Victoria, B. C.
- VE8 — Roy Walton, VE8CZ, Box 534, Whitehorse, Y. T.
- KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
- KZ5 — P. C. Combs, KZ5PC, Box 407, Balboa, C. Z.
- KH6 — Andy H. Fuchikani, KH6BA, 2543 Namaau Dr., Honolulu, T. H.
- KL7 — Box 73, Douglas, Alaska



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MULTI-BAND TANK ASSEMBLIES

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The MB-150 is intended for use in plate tank circuits having an input up to 150 watts. It is ideal for a pair of 807's, 809's or a single 829 B.

The MB-40L may be used in the grid circuits of tubes employing the MB-150L in the plate circuit. Will handle 40 watts if link is kept loaded.

National

 NATIONAL COMPANY, Inc.
 MALDEN, MASSACHUSETTS

Correspondence

(Continued from page 67)

It would be nice to have one band kept free of the high power now in vogue for 'phone in this country. There should be no doubt as to the large number of kilowatts now on the air if any listening is done on the 'phone bands. "But you have to have a kilowatt to get through all this QRM," is what you hear. . . .

There is, at present, only one place where the guy with low power and the inexpensive (no xtal filter) receiver can go and get all-around c.w. operating and that is on the 7-Mc. band. Let's keep it that way.

— J. D. Wells, W4TJU

10030 Holland St.
 Bakersfield, Calif.

Editor, QST:

Received my February copy QST and noted the letters regarding 40-meter 'phone.

Not one mention was made of the fact that no foreign 'phone operates in any American 'phone band. The minute any portion of the forty-meter band is opened to American amateurs every foreign amateur 'phone immediately moves out of that portion and, of course, in so moving, moves right into what we think is our c.w. portion. Out here in Southern California the Mexican 'phone on 40 is really terrible but fortunately very few of them operate in the 7000-7100 sector so we have at least that much now. Put American 'phone in the upper portion and we here know where the Mexicans will be.

I also note that only feeble arguments were presented about the fact that many (in fact, most) of the 40-meter gang today are in the under 100-watt class. Crowd the band up worse than it is and watch the fight for power. Forty has been a "poor boy's paradise" — 50 watts and he can hold his own. Witness the many Sweepstakes contest results — the winners use less than 100 watts of power, and forty is the big band in that contest.

Let's keep forty for c.w.

— David M. Sanders, W6EGX

10 LeRoy Place
 San Francisco, Calif.

Editor, QST:

Whoa! Hold everything! This 7-megacycle situation as reflected in the correspondence section of the February issue has every indication of turning into a first-class donnybrook which will not serve the unity of the amateur fraternity. There is much to be said on both sides and as you indicate in your proposal to the FCC asking for a delay, considerable research should be done. As might be expected the boys who think they are going to be hurt by this proposal are the ones who break into print and most of those who would benefit by it sit back and say nothing.

I have been operating for almost 25 years and the operation has been about equally divided between 'phone and c.w. The thing that stands out most vividly in my own mind are the days when the hottest spot on c.w. was between 7290 and 7300. Today you will find the spectrum from 7150 to 7300 almost dead with the hot spot between 7000 and 7100. I regret to say it but the pure c.w. boys should lose by default and the upper third of the 7-Mc. band should be opened to A3 emission.

— Richard T. Parks, W6UO

Strays

W0DIB closed down his 20-meter 'phone station one day after a contact with W2FGU/mobile. His first QSO next day was with W4FGU/mobile!

W1BBL, 80 years young, can zip along on a straight key with either hand. He was formerly a traffic chief for Postal Telegraph which means he can snow you with Morse, too.

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HAND CARRY

HT-21 (25-50 Mc.)
HT-22 (150-174 Mc.)

*On 25-50 Mc.
One watt output
on 150-174 Mc.



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Same performance and specifications as the "Littlefone" Hand Carry

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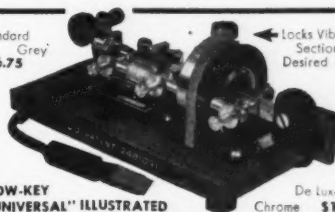
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HAM-ADS

- (1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.
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- (5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.
- (6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League, thus advertising bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him, takes the 30¢ rate. Provisions of paragraphs (1), (2), and (5), apply to all advertising in this column regardless of which rate may apply.
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- (8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ—Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

QSL CARDS—SWLS? Large variety. Samples, 25¢. Sakkers QSLs, W8DED, Holland, Michigan.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

QSL's by Glenn Print (W3FSW, Griffith). On vacation.

SUBSCRIPTIONS. Radio publications a specialty. Latest Call Books. \$2.50. Earl Mead, Huntley, Montana. W7LCM.

QSL's—SWL's Meade W0KXL, 1507 Central Avenue, Kansas City, Kans.

5-Element 2-meter beams. Riverside Tool Co., Box 87, Riverside, Ill.

WANTED: Your surplus radio receivers, transmitters, ARC-1, ARC-3, ART-1. We buy anything! What have you? Tom Allen, 159 Carlton Ave., Brooklyn 17, N. Y.

QSL's! Taprint, Little Rock, Mississippi.

QSLs, SWLS. America's Finest! Samples, 10¢. C. Fritz, 1213 Briar-gate, Joliet, Ill.

WANTED: TG-29 telegraph repeater. 1-193-A relay test set. Also wanted: Teletype 1 40th HP synchronous motor. W6ITH, Moraga, Calif.

ELIMINATE TVI. Shield your rig. 26 gauge heavy plated bright steel. Perforated 75 5/16 holes per in. Easily cut forms and soldered. Sheets 20" x 24", 2 for \$1.50, 10 for \$6.50 postpaid. Sample time in stamps. Republic Television, Inc., Dumont, N. J.

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QSL and SWL cards. Samples. WISQF, Minner, Candia, N. H.

ELECTRONIC technicians. For permanent positions with Sandia Corporation. Armed Forces acquired radar or electronic experience, trade school or junior college certificate with minimum two years experience. Versatility, capability and willingness to work most essential. Sandia Corporation, a subsidiary of the Western Electric Company, operates the Laboratory under contract with the Atomic Energy Commission in Albuquerque, New Mexico. Excellent working conditions and liberal employee benefits, including paid vacations, sick benefits, group life insurance and a contributory retirement plan. No housing shortage in the Albuquerque area. For further information write to the General Employment Division, Sandia Corporation, Sandia Base, Albuquerque, New Mexico.

WANTED: Top prices paid Navy surplus. 1F, 1G, 1CT, 5F, 5G, SCT and BC-348; BC-221. AN/ART-13, AN/ARC-1, AN/ARC-3, RTA-1B. Electric Research, 719 Arch St., Philadelphia.

QSLs, SWLS. High quality, reasonably priced. Cartoons, maps, fluorescent WN specialist. 15 samples and helpful booklet, 10¢. Robinson, W9AVH, 12811 Sacramento, Blue Island, Ill.

PHONE patch schematics, practical discussion, \$1.00. Nichols, W1MRK.

TECHRAD xmittr Mod. T-150 XM, pair 813's final, pair 805's mod. master osc., plus 5 extra pot. switch. Freq. 2 to 20 Mc. Org. Conds. Used 100 hours. Crated, \$750.00. F.o.b. Los Angeles, Earle Davis, W6WVI, 4306 W. 60th St., Los Angeles 43, California.

WANTED: Wireless Specialty. DeForest, Marconi, Electric Importing apparatus. Two slider tuning coils, early crystal detectors, Wireless Age, Electrical Experimenter, Year Book of Wireless Telegraphy and Telephony for 1913, 1914, 1915, 1916, Collins Wireless Telegraphy, "Ultimate" bug key. Other collectors please write me for mutual benefit in pursuit of our hobby. Louis Rizoli, W1AAT, 100 Bay View, Salem, Mass.

WANTED: Miller R-9er coil for 20 meters. Will pay current price. Kanne, W9QJ, 555 Sheridan, Glenview, Ill.

SPINNER knob. A handy spinner knob for communications receivers and transmitters. Speeds dial fast. Bakelite, black with metal inserts and aluminum or bakelite handle. 2 1/4" dia. and fits a 1/8" shaft. \$3.00. C. Dowler, W6QHA, 2015 Broadway, Vallejo, Calif.

WARNING! Do not buy BC-348-R serial 4103. Lost in mail from Guam to West Virginia. Ten bucks reward for locating. W8QDW, Center St., Mountaineer, W. Va.

FOR Sale: BC-610E trans., speech amp. 610E, also ant. tuning unit, coils for all bands, 100% TVI'd. Like new, \$350.00 complete. W. H. Atkinson, 14 Chatham Ave., Pleasantville, New Jersey. W2AQP.

FOR Sale: SX-71 and speaker, \$180. BC-312 with RA 20 A.C. supply, \$65; Triplet 2400 V.O.M., \$25; Raytheon VR6113, \$20; 2E24, \$3.50 each; QST Jan. '37 to Jan. '49, one binder, \$35.00. M. J. Marshall, 435 Washington Ave., Dumont, N. J.

BARGAINS: Extra Special Motorola P-69-13 mobile receivers, \$29.50; Globe King, \$315.00; HT9, \$199.00; HRO-50, \$299.00; Lyco 600, \$109.00; SP-400X, \$249.00; HRO-7, \$199.00; Collins 75A1, \$275.00; HRO-5T, \$175.00; SX-71, \$159.00; HRO-57, \$119.50; RME 2-11, \$99.50; RME-45, \$99.00; Meissner EX shifter, \$59.50; S-40A or SX-16 \$69.50; VHF-152A, \$69.00; HF-10-20 \$59.00; SX-24, \$69.00; Globe Trotter \$79.50; Meissner Signal calibrators, \$24.95; MB-611 mobile transmitter, \$29.00; 94800 exciter, \$29.50; X-10, \$14.95, and many others. Large stock of trade-ins. Free Trial! Terms are financed by Leo, W6GFW. Write for catalog and best deal to World Radio Laboratories, Council Bluffs, Iowa.

MEISSNER 150B with EX signal shifter, perfect condition, \$275.00. Hammarlund HQ-129X with matching speaker, \$135.00. Frating charges extra. Make an offer on the whole works. W6HAT, Box 325, Centerville, So. Dakota.

WANTED: Commercially built beam rotator and 10-20 combination beam. W5DA, 4425 Bordeaux, Dallas, Texas.

FOR Sale: Collins 12V2 in new condition, has been used very little. Price \$550. Martin Reeves, W9QJ 5412 Sycamore Dr., Mission, Kansas.

WANTED: AN APR-4, APR-5A, ARC-1, ARC-3, ART-13 etc.; TS-12 and other "TS"s, particularly Microwave equipment, even salvage; quantities of 72A/B, 3C22, etc. tubes; any Laboratory equipment. Top cash or swap; rush! Engineering Associates, 426 Patterson Road, Dayton 9, Ohio.

SAVE \$100. Complete amateur station, used less than 50 hours. Push to talk. Harvey-Wells Bandmaster Deluxe TBS-50D, APS-50 AC power pack, Turner 9D dynamic microphone, 12-PR 22 xtals, 4 for each phone band 10-20-75. National HC-57-B receiver. Everything just \$225.00. W6CVU, P.O. Box 224, Cedar Rapids, Iowa.

FOR Sale: New mod. 240 Lettine transmitter, with 10/40 and 80 meter coils and one crystal: \$75.00. F. H. Boyd, Ashton, Ill.

JOHNSON Viking VFOs have proven themselves in actual practice and on-the-air use. Although normally available in kit form, we can supply them wired, tested, with tubes, for only \$54.95. Just as a reminder, we can also supply the Johnson Viking transmitter complete at \$225.00. Trades and terms available on both VFOs or transmitters. Many used items are also available. Write for latest list to Carl Evans, W1BFT, Evans Radio, Concord, N. H.

FOR Sale: one Collins Model 20-C-2, 1000 watt AM xmitter, two Collins Model 20A 500 watt AM transmitters; two Western Electric Model 9-C AM transmitters. Used police transmitters 1682 Kc. Designed for use 1500 Kc-15,000 Kc. Iowa Police Radio, Fair Grounds, Des Moines, Iowa.

ANNOUNCING ARRL New England Division Convention and Hamfest, sponsored by Hampden County Radio Club, at Eastern States Exposition Grounds, West Springfield, Mass., Saturday, June 14, 1952. Registration and banquet, \$5.00. Registration only, \$2.00. Send checks to Albert Jackson, W1OBQ, Treasurer, P.O. Box 221, Springfield, Mass.

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COLLINS 30K transmitter, 500 watts band-switching, just like new. Cost \$1500; will take \$950. Also Hallicrafters SX-71 receiver \$125.00. W8DAW, 501 Pemberton, Grosse Pointe Park, Mich.

FOR Sale: RG-80 Coax in 29 ft. lengths with fittings, \$2.00 plus postage. C. F. Moretti, W2AII.

QSLs. High quality only. Quick delivery. Samples. Dortch, W4DDF Jocelyn Hollow Rd., Nashville, Tenn.

WANTED: BC-453-A in perfect condition, for Q5er. W1BB.

CHRISTIAN radio amateurs interested in missionary amateur nets contact W6QCB, 720 31st St., S. E., Cedar Rapids, Iowa for skeds and information.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, RME, Miller, Gonsat, Meissner, Harvey-Wells, Lyco, others. Reconditioned S-38, \$29.00; S-40A, \$69.00; SX-43, \$119.00; SX-71, \$149.00; SX-42, \$199.00; SW-54, \$35.00; NC-57, \$69.00; NC-46, \$49.00; NC-173, \$19.00; NC-183, \$19.00; HQ-129X, \$139.00; SP-400X, HROSTAL, HRO7, HRO50, HRO50-1, SX-25, S-72, SX-28A, HF-10-20, VHF152A, HT9, Collins 75A1, others. Shipped on trial. Terms. List free. Henry Radio, Butler, Mo.

FOR Sale: Workhorse Kilowatt. Send for pictures. You will be amazed at the equipment in this transmitter. Priced at a giveaway \$800.00, my floor. W1CPI, on 380 Kc.

NEW crystals for all commercial services at economical prices; also regrading or replacement crystals for broadcast. Link, Motorola, G-E, and other commercial types. Over 16 years of satisfaction and fast service. Edison Electronic Company, 1802 North Third, Temple, Texas. Phone 3-3901.

MISSOURI amateurs or others? If interested in permanent position as radiotelephone/cw operator in Radio Division of Missouri Highway Patrol, are to Director and 33, can use typewriter, and copy cw 20 WPM, write to Director, Radio Division, Missouri State Highway Patrol, Jefferson City, Missouri, for full details.

FOR Sale: HRO or trade: 1 small pole transformer, 1 250TTL, 1 12 volt in 440 v., 2A out dynamometer, W6ITE.

FOR Sale: BC610E 10 to 80, like new; BC614E speech amplifier (rack mounted); HRO 5TAF (rack mounted); 10" speaker (rack mounted) and mike. A complete station, \$625.00. Will finance if you live in or near Dallas. Write W5KWC, 1803 South Marsalis, Dallas, Texas.

COMPLETE Station: Kilowatt xmitter fone and c/w; Meissner ECO to 807 to T400 P.P. to 250TTL P.P. final; 100Watts P.P. modulator. Also Subroto MT15X with fixed power supply and LM15 freq. meter plus HRO revr. Well mounted in and on large desk, \$600 takes all. Must give up ham radio because of impaired hearing. W2NHO, Great Neck, L. I., N. Y.

LYSCO 10M fone xmitter 12W good with tubes, mike, \$15.00, W8NNM, 26-160TH Ave., Redding Beach, St. Petersburg, Fla.

WANTED: Instructograph, Harvey-Wells transmitter and test equipment. Will trade or pay cash. Bernard McConnell, 551 West 14th St., New York City 13, N. Y.

FOR Sale: Harvey-Wells TBS 50 DeLux, 1500 volt power supply, Reasonable. Lawrence H. Lapinski, c/o Wausau Oil Co., North Third, Wausau, Wisconsin.

WANTED: Old type carbon mike which is suspended by springs inside metal ring. Ray Caldwell, W4ATJ, 316th Army Band, Camp Rucker, Alabama.

S-36 receiver, complete, \$250.00; PE-110 AC power supply, \$39.50; SCR-522, complete with tubes, \$39.50. Roscoe E. Magee, W4LZS, Box 454, London, Kentucky.

866A kit, two tubes, sockets, transformer, \$6.98; Selenium rectifier and transformer 0-10 VDC 1/2 amp, \$29.50. Sell your surplus tubes and equipment. Send for free Tabogram, "TAB", 109 Liberty St., New York 6, N. Y.

SELL: BC342N, matching speaker, noise limiter, \$60.00. J. Hargrove, W2ZTL, Lido Hocking, Apt. C4, Lido Beach, N. Y.

WANTED: Aircraft radio technicians. Experienced installation and maintenance all types aircraft electronic, communication and navigation equipment. Write, stating education, experience and starting salary desired. Atlantic Aviation Service, Box 1709, Wilmington, Del.

SELL: Mackay 167BV xmitter, 81% final, complete set of tubes. New, never used. Beautiful cabinet. See CQ for Jan. 1948, Price \$160.00. Davies, 48 Atherton Ave., Wyoming, Penna.

SELL old issues of QST: Sept. to December 1916; January to September 1917; July to October and Dec. 1919; May 1922; also April to September 1917; 5 issues 1928; complete 1929; 8 issues 1930; complete except August 1931; complete run except March and August 1932; complete 1933; Jan and Feb, 1934. 85 issues in all. Condition good except 14 covers missing but no missing pages. Sell as one lot to best offer. Louis F. Lauman, EX-WGUDJ, Box 38, Dixon, Mo.

TRY us first! Will trade new mobile equipment, TV, test equipment, for any TS, I, IE equipment and parts like 1-95, 1-10, TS-35, ARC-1, ARC-3, ART-13, DY-12, DY-17, RTA-1B. Top cash paid. Alvarado, 4665 Melrose Ave., Los Angeles 29, Calif.

SX-62 WANTED. Must be in perfect condition. Will sell \$47 less than one year old. Guarantee perfect condition. E. E. George, 1508 Stonewall Road, Little Rock, Arkansas.

SELL: QST in QST binders for years 1936 thru 1949. Radio Magazine complete from January 1936 thru Sept. 1942, except January 1940. CQ from February 1946 through Dec. 1949. All excellent. W8TXE, 213 Tulp Road, Crystal Lake, Medway, Ohio.

SELL (no trades) BC-645A, new with tubes, unaltered, extra pair final tubes, \$12; ARC-5 receiver, 19-55 Mc. converted from new, minus pack, \$20; 4-250A used less than 10 hours, socket included, \$30. Fil. trans. same, \$5; pair new surplus 194T1A, \$10; pair new surplus 872Aa, \$3; surplus bug J-36, \$7; UHF Resonator 32 el. beam, 435 Mc., assembled, never used, unweathered, new must be called for, \$40. All sold F.o.b. WIAH, Cheshire, Conn.

SELL or Swap: Radar transmitter, receiver BC1267A 154-186 Mc. 25 tubes, companion power supply 110 V, 60n and instruction book. Want receiver, BC121, transmitter. Write for information, Jim Hill, W6IVW, Box 373 Cary Hall, Lafayette, Ind.

AM not getting any response at all on my ad asking for Cali Books to complete my kit. Please check my ad in the last issue and if you should have just one of the Cali Books listed, I would certainly appreciate a response. Thank you. Will be glad to verify your pre-1917 call letters if you wish. Bob Willis, W1PN, Box 26, Hyannis, Mass.

WANTED: SX-42 or SX-28A receiver, W6VZH, 524 West 12th Alliance, Nebr.

NO ROOM! Want 500 watt transmitter? Make offer! Geo. D. Jones, WK1G.

NEW HF10-20, \$55. Hickok 288X, \$95; 277X, \$75, both like new. Electronic Labs, 2444 D, Lincoln, Nebr.

SELL or trade: Contax II with or without accessories for ARC-13, RA34, TCS, BC1306, PE-237 or test equipment. T. Clark Howard, WIAFN, 46 Mt. Vernon St., Boston 8, Mass.

SELL: Stancor ST-203 mobile transmitter, metered, \$50. Lyco 381 mobile VFO, \$20. Lyco 129 mobile xmitter, \$20. BC-610E converted for 75 mobile, clamp modulation, metered, \$87.50 final, \$30. Transmitter modulation and field-strength meter, \$15. Or best offers. W9KLR, Route 5, Rensselaer, Ind.

Two-Color QSL's, 500 for \$1.50. Cellulose QSL's, sample 10c. Atlantic Press, P. O. Box 146, Clifton, N. J.

SELL or trade D222A. Brand new condition. Want: VHF152A in good cond. W5SAU, 407 Ann St., West Reading, Penna.

QSL's. Brownie, W6CJL (Richard Brown again in business) 433 Chestnut St., Emmaus, Penna.

FOR Sale: Transmitters, receivers, tubes, parts, new or used and surplus. Write for list. Radio, Box 375, Winchester, Va.

WNTEC would like assistance of a local ham to TVI-proof two rigs: TBS50D and TR-1 (2 meters). Call ST 2-1176. Write J. Zukauskas, 2227 Gtn. Ave., Phila. 33, Penna.

TELETYPE receiver, model 12, \$40. Jonathan Eddy, W2J1, Cortlandt 7-2251, New York City.

RME VHF-152A, \$65; DB22A, \$60; Panoramic Adapter PCA-21, 200, \$60; Astatic DN-HZ mike, \$15; Hammarlund HQ129X, spkr, \$140; BC221-A, \$75; Meissner signal shifter, \$42.50; Stancor 110-615 watta, all bands, \$35; Mon-Key, \$20; McElroy bug \$6.00; Silvertone wire recorder, \$65; Lyco 150 novice xmitter, \$27.50; 190-550 command revr. \$11.50; Superior multimeter 670, \$15; SCR522 xmitter, \$10; RU-165F/11 VFO, \$12.50; large assortment of transmitting and receiving tubes; command transmitters; Triplett modulation meter; NRI radiocrystals course; Sam's Photo-facts; Cardwell XE-240-XD and Johnson 100D90D condensers; Underwood portable \$45; quartz crystals; surplus standard equipment manuals; meters, relays, transformers; TS-10-G sound powered handsets. Everything guaranteed. Write immediately. Howard Severeid, W9DPL, 2431 East Riverside Drive, Indianapolis 23, Indiana. Telephone Winthrop 2184.

COUNSELLOR wanted for Maine Boy's Camp for summer. License required to operate Ham voice station, 20 years minimum age. Healy, 18 Floral, Hastings-on-Hudson, N. Y.

SELL: 10-20 meter transmitter, 700 watts phone and CW. Pr. \$125.00. Class B, 100W. Modulation 20%. Millen exciter. All enclosed 66" rack and panel. Excellent construction and wiring gives big commercial appearance. All equipment purchased new. No war surplus used. Original cost \$800. Sacrifice to best offer over \$450. Due to traveling job, very little time for operation. Prefer local buyer. Will ship if necessary. C. Archibald, W9LHK, 1727 West St., Peru, Ill. Tel 2893-R.

TW-12, MP-28BA Mod. 115VAC supply, 80W, 80-40-20M, cost \$149.00. 6-10-15VAC clamp tube Mod. 115VAC, cost \$210.00. SELL \$175. Gonset 6-10-15M converter, 115VAC, new, \$66; DB-22A preselector, new \$75. Send for list. Sell above or trade for: Original Vibroplex, Amphipol 10-20M signal squitter beam, rotator, indicator, BC-610B, BC-614E with adj. link coils. W7NHC, Maw, 1325 24th St., Ogden, Utah.

SELL: NC183 in brand new condition, less than 25 hours operation, in original shipping box. Receiver and speaker, \$200.00. Forst, 2605 Louisiana, Beaumont, Texas.

SELL: Link mobile transmitters, 2-6-10 meter used, very good. Leece-Neville AC system for mobile, 80 amp. 7 foot. Hopped-up, perfect Collins 75A1, \$300. Might trade. R. D. Clark, 126 Slossom, Staten Island 14, N. Y. W2WNW.

SELL: 1952 Hallcrafters S-77, \$83.00. W8HBL, 1546 Dakota, Flint, Michigan.

JOHNSON Viking for sale, in perfect cond. Used less than 50 hours. Spare 829B, mike and manual included. \$235.00. Meissner signal shifter, 160 to 10, \$50. W2DVZ, W. Nissen, 45 Wrentham St., Kingston, N. Y. P.O. Phone 6894W.

SELL: Two 10 mtr. 25W mobile xmitters, \$21 and \$16, 200 W 20-40 mtr c.w. xmitter, \$17.50. Grid dip, \$16. W6RET, 550 So.G, Oxnard, Calif.

COLLINS 30J transmitter in new condition with coils and crystals for 160, 80, 20, and 10 meters. Beautiful walnut brown cabinet with chrome trim. Also have new, never used 310-B1 exciter, custom built in cabinet matching 75A-1. Transmitter only \$550, with 2209 Blake 100, Cedar Rapids, Iowa.

LYSCO 600 like new. De-bugged. Non-swisher. First \$110 takes. Also 20 watt modulator to handle above, \$20. W6JBI, 2642 So. Humboldt, Denver 10, Colo.

FOR Sale: HT9 in perfect cond. 10 and 160 meter coils and 2 crystals. Also xmitter and speaker. No reasonable offer refused. W9JHB, Box 292, Libertyville, Illinois.

WANTED: Early DeForest and Marconi wireless apparatus. Also early tubes and early magazines, Call Books, text books and other literature. Franklin F. Wingard, Rock Island, Illinois.

"ELECTRONIC Calculators", "Electronic mathematics", "Audio Engineering" data sheets, 50¢ each or 3 for \$1 postpaid. Technical Question Answering Service #1 per letter. Willard R. Moody, Consulting Electronics Engineer, 5705 Carters Lane, Riverdale, Maryland.

JOHNSON Viking for sale, with tubes. Wired. Brand new. W1TQE.

FOR Sale: HQ129X, perfect cond. Best offer over \$125. Will swap National 1-10 for Hunter 20B, test equipment, etc. Luzuriaga, 1470 Beacon St., Brookline, Mass.

SELL: UTC LS-61 output transformer, new, \$16. National PW-4 condenser, with 100, 20, and 10 meter coils, \$10. W4LAM, 1848 Winston, Charlottesville, Va.

COLLINS 75A2 brand new receiver with matching speaker, original factory cartons, 3 weeks old, will trade suitable swap for 1947-8 Chevrolet or Ford, 1st class cond. Going South. Receiver too new to ship. J. M. W2VVE, 2917 Far Rockaway Blvd., Far Rockaway, L. I., N. Y. Far Rockaway 7-5364.

SELL: Model 150A Lavoie Laboratories microwave frequency meter 100 to 200 Mc. Self powered. In wood case. \$80.00. W8VLB, Glenn F. Markley, RFD 44, Mansfield, Ohio.

PANADAPTOR (SP-44) to swap for best cash or trade offer. Paul Wells, W7OMX, 2708 106th Place, S. E. Bellevue, Washington.

AN/APR-4 COMPONENTS WANTED

In any condition. Also top prices for: ARC-1, ARC-3, APR-1, APR-5A, etc.; TS-35 and other "TS" and standard test equipment, especially for the MICROWAVE REGION; ART-13, BC-340, BC-221, LAE, LAF, LAG, and other quality Surplus equipment; also quantity Spares, tubes, plugs and cable.

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90651

The No. 90651 GRID DIP METER

The No. 90651 MILLER GRID DIP METER is compact and completely self contained. The AC power supply is of the "transformer" type. The drum dial has seven calibrated uniform length scales from 1.5 MC to 300 MC plus an arbitrary scale for use with the 4 additional inductors available to extend the range to 220 kc. Internal terminal strip permits battery operation for antenna measurement.

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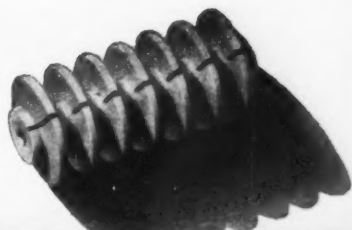
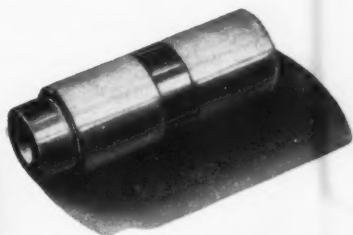
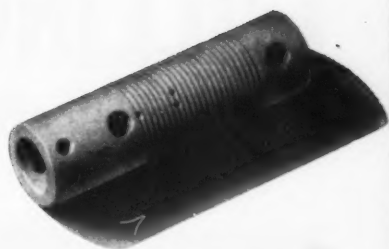
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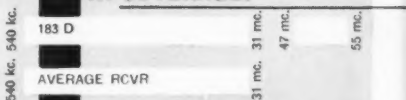
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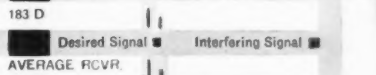
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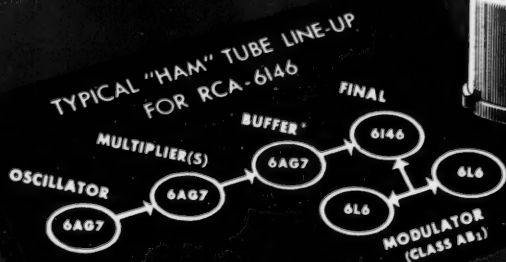


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